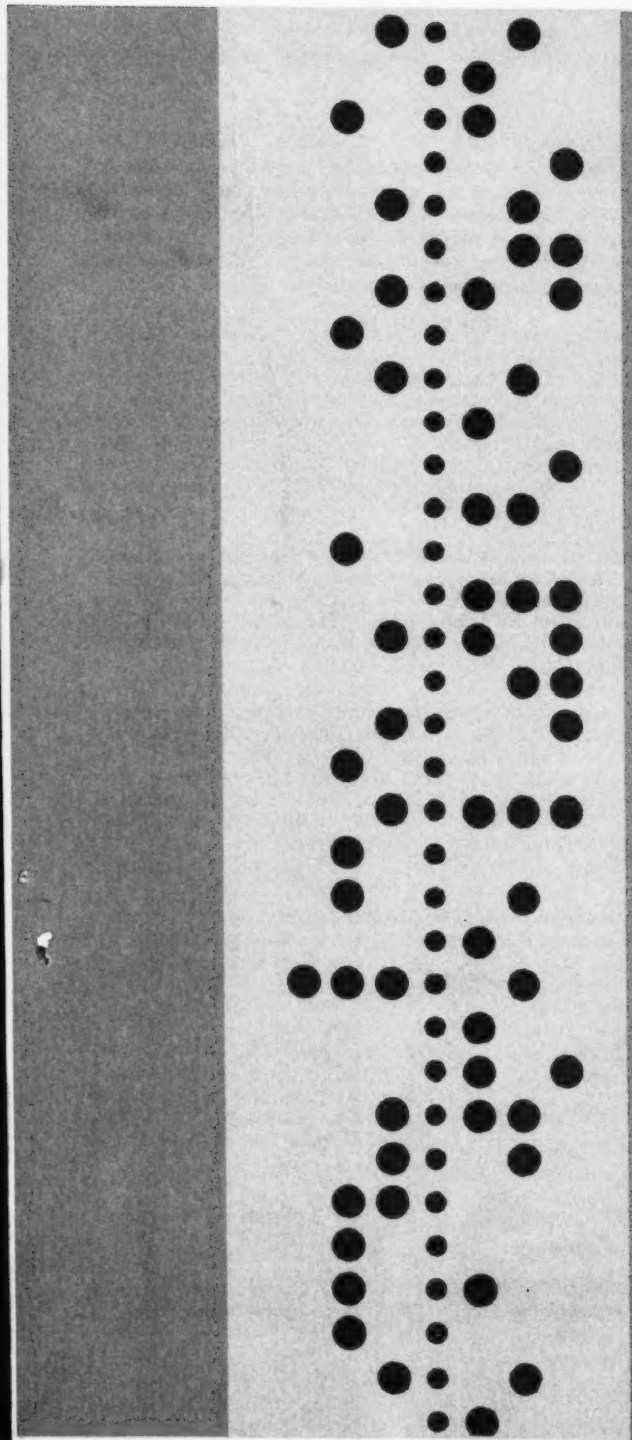
U.S. GOVERNMENT

RESEARCH & DEVELOPMENT REPORTS

June 5, 1965



A Semi-monthly

Abstract Journal

for

Science and

Industry

CLEARINGHOUSE

FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION

An agency of the U.S. Department of Commerce

June 5, 1965 / Volume 40, Number 11

U.S. Government

RESEARCH AND DEVELOPMENT REPORTS

Issued twice a month by the Clearinghouse for Federal Scientific and Technical Information (formerly Office of Technical Services). Annual subscription $15 ($3.75 additional for foreign mailing). Single copy $1. Make remittance payable to Superintendent of Documents and mail either to a U.S. Department of Commerce Field Office or to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Address changes should be sent to Superintendent of Documents.

PURPOSE

U.S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS (formerly U.S. Government Research Reports) is published by the Clearinghouse for Federal Scientific and Technical Information to announce the availability to the public of new reports of U.S. Government-sponsored research and development released by the Department of Defense and other Federal agencies. The Atomic Energy Commission and the National Aeronautics and Space Administration issue their own announcement journals as noted below.

FORMAT

USGRDR contains two sections with a combined table of contents. The first section, "Technical Abstract Bulletin" (TAB), announces reports released by the Defense Documentation Center (DDC) of the Department of Defense. The second section, "Other Research Reports and Related Material," announces reports released by civilian agencies and also includes certain older military reports. Reports are listed by accession/report number under 33 subject division headings. Both sections contain abstracts and complete bibliographic citations and are followed by their respective indexes. Reports of current high industrial interest are featured in **"Research Highlights."**

HOW TO USE

Readers are urged to review all abstracts in their fields of interest, noting accession/report numbers and titles of reports to be ordered. Although primarily for retrieval, the descriptors provide a quick grasp of a report's scope. The reader is reminded that reports applicable to his field may be found under various subject divisions; the various indexes will aid in locating those reports. Cumulative indexes are published periodically.

TO ORDER REPORTS

Order reports by accession/report number (as given on the first line of each entry) and title from the Clearinghouse, U.S. Department of Commerce, Springfield, Va. 22151, or from any Commerce Field Office (listed on inside back cover). Prices for hard copy (HC) and microfiche copy (MF) are given for each entry. Prepayment is required unless purchases are to be charged to Superintendent of Documents deposit account. Order forms will be found in the back. Make check or money order payable to National Bureau of Standards—CFSTI.

OTHER JOURNALS

Reports of the National Aeronautics and Space Administration and the Atomic Energy Commission can be ordered from the Clearinghouse. Reports available are listed in the following journals open to public subscription from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

NUCLEAR SCIENCE ABSTRACTS, Atomic Energy Commission, $30 a year domestic, $37 foreign, $1.75 single copy plus 25 percent foreign mailing.

SCIENTIFIC AND TECHNICAL AEROSPACE REPORTS. National Aeronautics and Space Administration, $33 a year domestic, $42 foreign, $2.25 single copy plus 25 cents foreign mailing.

U.S. DEPARTMENT OF COMMERCE
John T. Connor, Secretary

CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION
Springfield, Va. 22151
Bernard M. Fry, Director

Contents may be printed freely. Mention of source will be appreciated.
Use of funds for this publication approved by the Director of the Bureau of Budget, June 30, 1961.

RESEARCH highlights

Reports of current high industrial interest

Categories

	Page
Chemicals	i
Coatings	ii
Electronics	ii
Fuels	iii
Metals, Non-Ferrous and Alloys	iii
Optics	iii
Rubber	iv
Semiconductors and Related Materials	iv
Testing, Analysis	v
Transportation (Land, Sea, Air, Space)	v

Chemicals

PURIFICATION OF ORGANIC COMPOUNDS

Recent improvements in column design and operating procedures give reliable and consistent separation data in the purification of organic compounds by thermal diffusion. One experiment involves both unpacked and packed columns with an analysis of results in relation to theoretical predictions. Philco researchers say the uniformly packed column without reservoirs is capable of giving much greater separations than a similar unpacked column but only with a sacrifice of relaxation time. An advantage of the packed column is that close tolerances on the slit width are not required. Continuous packed column performance is like that of the unpacked in its dependence on the feed flow rate. Problem areas remaining include predicting the value of permeability required to obtain a maximum steady state separation in a uniformly packed batch-operated column without reservoirs, multicomponent organic system column separation behavior, and the determination of solvent effectiveness in increasing separability. Order from the Clearinghouse AD-610 264, HC $4.00/MF $1.00; PURIFICATION OF ORGANIC COMPOUNDS BY THERMAL DIFFUSION.

Coatings

CORROSION RESISTING WHITE PRIMER

A white primer based on a safflower RJ100 urethane contributes superior corrosion resistance to 2219 aluminum alloy. Chicago Lacquer Laboratory researchers indicate that a combination of titanium dioxide and zinc molybdate pigments contributes toward maximum protection. Optimum pigment combination is 90 percent titanium dioxide and 10 percent molybdate. Proper cleaning of metal surface and a primer film thickness of about 5/10 mil are essential. Order from the Clearinghouse N65-12419, HC $1.00/MF 50 cents; DEVELOPMENT OF CORROSION INHIBITING WHITE PRIMER.

Electronics

REVIEW OF GOVERNMENT R&D IN INTEGRATED CIRCUITRY.

Integrated circuitry has come of age in defense and space electronic systems and will find increasing application in consumer items. Primary reasons for the growing number of uses are the inherent advantages of this technology—improved reliability, reduced cost, and smaller size and weight. These disclosures are made in an information package prepared by the NBS Institute for Applied Technology that reviews Government R&D in circuit design and fabrication as well as applications in electronic systems. The computer field particularly has benefited much from integrated circuitry, according to the review. Monolithic circuits are now being used with multi-chip (hybrid) microelectronic circuits. Molecular circuits are being used in integrated logic nets. Digital logic blocks are used in semiconductor microelectronic systems. Program-logic elements, 10-bit analog-to-digital converters, and optoelectronic functional amplifiers are additional computer uses. Applications in other electronic areas, including telemetry and switchboards, are also described in the review. It also contains bibliographies of reports on the subject available from the Clearinghouse. Order from the Clearinghouse OTR-111, HC only, 50 cents; INTEGRATED CIRCUITRY.

ORGANIC MATERIALS FOR MOLECULAR ELECTRONICS

In experiments on the use of organics as photoconductors, polymers doped with triphenylene exhibit a photoconductivity spectrum corresponding to the optical absorption of the plastic, according to RCA researchers. The photocurrent magnitude is a function of temperature and polarity of the illuminated electrode. Doping of polymers appears to have no effect on photoconduction. A charge storage or frozen charge effect is found when high fields are applied in both light and dark conditions. RCA recommends that further work should be done on the charge storage mechanism to see if it would be useful as an electrostatic memory. The long lifetime of the triplet state of molecules in methylmethacrylate suggests optical applications. The Air Force-sponsored researchers say it would be of interest to find how widespread this phenomenon is among other organic materials. RCA also recommends additional research on controlling substrate temperature to develop a general technique for using organics in physically perfect and electronically useful films. Order from the Clearinghouse AD-612 283, HC $1.00/MF 50 cents; UTILIZATION OF ORGANIC MATERIALS FOR MOLECULAR ELECTRONICS.

Fuels

RADIOACTIVE TRACERS IN PETROLEUM PRODUCTION

No major problems are encountered in the use of radioisotopes as tracers in miscible-phase petroleum recovery, says the Bureau of Mines. Tritium has been used in field experiments to trace the flow of gasoline, isopropanol, and water. The relative vertical saturation of a producing formation with injected fluid has been found by an analysis of liquids extracted from cores obtained during the test. Tritium compounds, in particular, help to get otherwise unavailable data. Hazards involved are not serious; they are normally less than those involved when using combustible materials and toxic hydrocarbons. Order from the Clearinghouse TID-21199, HC $2.00/MF 50 cents; RADIOACTIVE TRACERS IN MISCIBLE-PHASE PETROLEUM PRODUCTION OPERATIONS.

Metals, Non-Ferrous and Alloys

PROMISING ALPHA-BETA TITANIUM BASE ALLOYS

Several alpha-beta titanium base alloys show promise for eventual use as structural materials. Army researchers have achieved favorable strength and mechanical properties by the addition of substitutional and interstitial elements. The addition of varying weight percentages of Cr, Mo, Mn, Ni, U, and Zr and of O, N, C, and B to the base alloy, Ti-6Al-6V-22Sn-1/2Fe-1/4Cu (weight percent), has resulted in materials which exhibit mechanical properties superior to those of the basic alloy. For example, for the basic alloy optimum mechanical properties are 198,000 psi yield strength at 0.1 percent offset, 205,000 psi tensile strength, 5 percent elongation, 14.0 percent reduction of area, and 5.4 ft-lb Charpy V-notch impact energy at -40°F. However, for Ti-6Al-6V-2Sn-3/4Cu-3Zr-0.015N-0.114 0_2-0.00217H-0.12C, a yield strength of 221,000 is achieved at 0.1 percent offset, with 224,000 psi tensile strength, 11.9 percent elongation, 32.1 percent reduction of area, and 5.9 ft-lb Charpy V-notch impact energy at -40°F. Order from the Clearinghouse AD-613 651, HC $1.00/MF 50 cents; DEVELOPMENT OF TOUGH, HIGH-STRENGTH ALPHA-BETA TITANIUM BASE ALLOYS.

Optics

REPLICA OPTICS

Replicas of concave spherical mirrors of high quality and accuracy can be made easily by a simple process developed for the Army by Electro-Optical Systems, Inc. The equipment required for plastic replication is readily available, and a glass master can be used at a small cost per replica. For aspherics, plastic submasters are recommended and are economically feasible. Spherical preforms can be machined from various common metals and meet shock environment resistance requirements. EPON 829 and DEAPA resin systems satisfactorily produce high quality replicas. Flexible epoxies and polyurethane offer higher resistance and durability for submasters. Future work, the researchers say, should cover a thin-film high-accuracy casting replication technique designed into a reflective optic system. Order from the Clearinghouse AD-611 417, HC $4.00/MF $1.00; REPLICA OPTICS.

Rubber

HIGH-TEMPERATURE FLUOROELASTOMERS

Army attempts to improve high-temperature properties of FPM (vinylidene fluoride/hexafluoropropylene) vulcanizates have been partially successful. Researchers found that calcium oxide is effective in eliminating the porosity associated with thick section post-curing of FPM. The use of carbon and graphite fibers results in improved high-temperature strength. Improved high-temperature properties also result from heat treatment and carbon black in the presence of N-methyl-N, 4-dinitrosoaniline. However, the researchers say the use of several phenolic and malamine resins and high temperature press cures do not improve the properties of FPM at high temperatures. Order from the Clearinghouse AD-609 003, HC 50 cents/MF 50 cents; IMPROVEMENT OF HIGH-TEMPERATURE PROPERTIES OF A FLUOROELASTOMER--PART II. Earlier work on this problem, Part I, AD-434 350, HC only, 75 cents, is also available.

Semiconductors and Related Materials

ACTIVE THIN FILM TECHNIQUES

Device-quality silicon films can be vacuum deposited on glazed polycrystalline substrates at an optimum temperature of between 1000° and 1100°C with silicon film pressures of 5×10^{-6} torr being necessary, according to Sylvania. A compact electron beam increases the rate of silicon evaporation to 12 microns per hour. Using two-layer devices of p-type and n-type silicon of predetermined doping levels, diodes are fabricated with reverse breakdowns up to 116 volts at 100 microamperes and forward currents of 2 milliamperes at 4 volts. Order this Navy-sponsored research report from the Clearinghouse AD-607 371, HC $3.00/MF 75 cents; ACTIVE THIN FILM TECHNIQUES MICROMIN PROGRAM.

DIELECTRIC CONSTANT OF GERMANIUM

Carefully checked measurements show beyond doubt that both the n- and p-types of germanium with 1/2 ohm-cm resistivity behave anomalously at 92 Gc as a function of the temperature, according to Fort Monmouth studies. At microwave frequencies, the dielectric constant is a function of the conductivity; this, in turn, is a function of the mobility. When the frequency reaches a certain value, the carriers can no longer follow the field; conductivity decreases, and so does the dielectric constant. The theoretical study of the dielectric constant as a function of frequency and resistivity is essentially a study of the mobility of the carriers. Present theories of mobilities are inadequate to account for the behavior of the dielectric constant even for high resistivities, not to mention the anomalous behavior of the 1/2 ohm-cm resistivity in n- and p-type Ge. Order from the Clearinghouse AD-612 897, HC $1.00/MF 50 cents; DIELECTRIC CONSTANT OF GERMANIUM AS A FUNCTION OF FREQUENCY, TEMPERATURE, AND RESISTIVITY.

Testing, Analysis

CONFIDENCE LIMITS FOR THE RELIABILITY OF SYSTEMS

A new mathematical technique has been used by Rand Corporation to determine the approximate confidence limits for the reliability of series, parallel, and series-parallel systems. The technique uses only component failure data and it is applied when the reliability of each component has been previously estimated. The data are combined to determine confidence limits for the whole mechanism. It is assumed that the failures are independent, and that failures of a given component follow a binomial distribution with unknown parameter, the component reliability. The large-sample properties of the likelihood-ratio test are then used to construct the appropriate confidence limits for the system reliability. Order this Air Force-sponsored study from the Clearinghouse AD-609 429, HC $1.00/MF 50 cents; APPROXIMATE CONFIDENCE LIMITS FOR THE RELIABILITY OF SERIES AND PARALLEL SYSTEMS.

ULTRASONIC SPECTROSCOPY OF STEEL

An ultrasonic spectroscope constructed by Army researchers employs the pulse-echo test procedure. Experimental results obtained with steel specimens indicate that it can separate specimens according to their grain structure and thus can serve as a useful indicator of mechanical properties. The technique, for example, can be applied to examining test specimens for proper heat treatment. In comparison with multiple-echo attenuation testing carried out at discrete frequencies which are consecutively applied to the test specimen, Army researchers say the spectroscopic test offers various advantages. It is much faster; it provides a reliable built-in reference level to check coupling conditions and equipment sensitivity; and it does not necessitate the use of multiple back-echoes. Hence, results are not influenced in an uncontrollable manner by the loading effect of the transducer upon the test surface encountered in direct-contact testing. Order from the Clearinghouse AD-614 113, HC $1.00/ MF 50 cents; ULTRASONIC SPECTROSCOPY OF STEEL. (This document cited in this issue on page 131.)

Transportation (Land, Sea, Air, Space)

PROPERTIES OF BUOYANT MATERIALS AND STRUCTURES

A comprehensive review of the properties of buoyant materials and structures has been prepared for the Navy by Proteus, Inc. The document gives design factors of gases and buoyant liquids and solids, cellular substances, materials for rigid shell floats, protective coatings for various flotation devices, and some typical flotation structures. Another section offers generalized mathematical relations for calculating the buoyancy and related parameters of a structure in any form and combination of materials. The compilers aimed to provide answers to the designer on such facets as density, compressibility, thermal expansion coefficient, mechanical strength properties when subject to the ocean environment, and stability characteristics under the conditions of storage and use. Other important variables considered are availability, cost, reliability, and fabrication limitations. The publication is applicable to surface floats, submerged floats and buoys, neutral floats, payload recovery floats, subsurface vehicles such as submarines and bathyscaphes, instrument packages, and other structures requiring buoyancy. The introduction notes that buoyancy should not be added as an afterthought but should be designed into the underwater system from the beginning and harmonized with the other functions to obtain a satisfactory overall design. Order from the Clearinghouse AD-609 821, HC $6.00/MF $1.50; PROPERTIES OF BUOYANT MATERIALS AND STRUCTURES.

The abundance of R&D reports available creates a problem for industry in extracting those most likely to prove of value--for technical solutions and in keeping up with new developments. These Clearinghouse tools and services, and others planned, are designed to narrow the search.

PINPOINTING R&D REPORTS

Selection Aids For Industry

▶ GOVERNMENT-WIDE INDEX appearing monthly is a single reference guide to Government-sponsored research and development announced in four of the major technical announcement journals of the Federal Government: USGRDR, Technical Abstract Bulletin of the Defense Documentation Center, Nuclear Science Abstracts of the Atomic Energy Commission, and Scientific and Technical Aerospace Reports of the National Aeronautics and Space Administration. (Annual Subscription $10, $2.50 additional for foreign mailing, $1.25 single copy.) Available from Superintendent of Documents, U.S. Government Printing Office, Washington, D. C., 20402.

▶ SELECTIVE BIBLIOGRAPHIES--from Abrasives to Zirconium--will be mailed free. A list of more than 200 available from the Clearinghouse will be mailed on request. Here is a sample list of ten:

SB-441 Materials Testing	SB-523 Batteries
SB-444 Electronic Miniaturization	SB-524 Expanded Plastics
SB-480 Textile Fibers	SB-526 Metal Composites
SB-515 Paper	SB-529 Hydrofoil Boats
SB-518 Paints and Varnishes	SB-541 Fluid Amplifiers

▶ LITERATURE SEARCHING SERVICE provides two kinds of bibliographies:

a) Current Awareness on selected fields of interest on a periodic basis.
b) Retrospective, listing the literature available to date.

These searches are made to order using the combined facilities of the Clearinghouse, the Science and Technology Division of the Library of Congress and the science collections of the Departments of the Interior and Agriculture, or any combination of these facilities at $11 an hour (8 hours minimum searching time).

▶ FAST ANNOUNCEMENT SERVICE reviews reports of special industrial significance. Announcements are classified and mailed by industrial category. No charge.

▶ RESEARCH REVIEWS at 50 cents a copy are packaged summaries, abstracts and bibliographies gathered under the following titles (other titles are in progress):

OTR-101 Hot Machining	OTR-110 Thermoelectric Materials and Fabrication
OTR-102 Nickel-Titanium Alloys	OTR-111 Integrated Circuitry
OTR-103 Photochromism and Phototropism	OTR-112 Fluid Amplification
OTR-104 Fire Extinguishing Material Technology	OTR-113 Ultrasonic Welding and Fabrication
OTR-105 Flame-Retardant Textiles	OTR-114 Ultrasonic Testing of Materials
OTR-106 Humidity Controlled Warehousing	OTR-115 High Energy Metal Forming
OTR-107 Concrete Technology	OTR-116 Numerical Controls
OTR-108 Volatile Corrosion Inhibitors	
OTR-109 Grease Lubrication	

CONTENTS

Section I TECHNICAL ABSTRACT BULLETIN from Page 1 to 152 (Printed on white paper). Announces reports released to the public by the Defense Documentation Center.

Section II OTHER RESEARCH REPORTS AND RELATED MATERIAL from Page S-1 to S-38 (Printed on blue paper). Announces reports released by AEC, NASA and other civilian agencies and also certain older military reports. Included are AEC's Engineering (CAPE) Drawings, Government-Owned Patents and Privately-Owned Patents in the area of Lubricants.

Subject Divisions for Both Sections

		Page No.
1	Aircraft and Flight Equipment	1
2	Astronomy, Geophysics, and Geography	3, S-1
3	Chemical Warfare Equipment and Materials	18
4	Chemistry	19, S-13
5	Communications	30, S-13
6	Detection	32
7	Electrical Equipment	33, S-13
8	Electronics and Electronic Equipment	35, S-14
9	Fluid Mechanics	49, S-16
10	Fuels and Combustion	54
11	Ground Transportation Equipment	No Entries
12	Guided Missiles	55, S-17
13	Installations and Construction	56, S-17
14	Materials (Non-Metallic)	59, S-17
15	Mathematics	62, S-20
16	Medical Sciences	67
17	Metallurgy	84, S-29
18	Military Sciences and Operations	91
19	Navigation	92, S-29
20	Nuclear Physics and Nuclear Chemistry	93, S-30
21	Nuclear Propulsion	102
22	Ordnance	103, S-32
23	Personnel and Training	103
24	Photography and Other Reproduction Processes	104, S-32
25	Physics	105, S-32
26	Production and Management	131, S-34
27	Propulsion Systems	133, S-35
28	Psychology and Human Engineering	135
29	Quartermaster Equipment and Supplies	138
30	Research and Research Equipment	139, S-36
31	Ships and Marine Equipment	148
32	Miscellaneous Arts and Sciences	150, S-38
33	Transportation	152, S-38

Index Divisions for Both Sections

Subject Index	A-1, S-39
Personal Author Index	B-1, S-41
Corporate Author-Monitoring Agency Index	C-1
Corporate Source Index	S-43
Contract Index	D-1, S-45
AD - Division Index	E-1
Accession/Report Number Index	S-47
Price List	S-49

TECHNICAL ABSTRACT BULLETIN

1. Aircraft and Flight Equipment

AD-613 955 Div. 1, 30
CFSTI Prices: HC$2.00 MF$0.50

Bureau of Aircraft Production, Dayton, Ohio.
Airplane Engineering Dept.
FULL FLIGHT PERFORMANCE TESTING. PHYSICAL DATA AND TYPES OF INSTRUMENTS REQUIRED: METHODS OF CORRECTING AND RECORDING RESULTS ON STANDARD FORMS.
1918, 50p

Unclassified report

Reprinted from The Bulletin of the Airplane Engineering Department, U. S. A., Vol. 1, No. 2, July 1918.

Descriptors: (*Flight testing, Test methods), (*Flight instruments, Recording systems), Test equipment, Instrumentation, Data, Performance (Engineering), Calibration, Test methods, Standardization.

A summary is given of the subject to facilitate standardization of the methods of testing and recording of results. It deals solely with standard performance tests and climb and speeds at varying altitude, with no consideration of stability, controllability or radiator and engine performance.

AD-614 016 Div. 1, 2, 9
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
EXPERIMENTAL PROGNOSES OF AIRCRAFT BUMPINESS BY A DEFINED RICHARDSON CRITERION,
by M. V. Zavarina and M. Z. Emel'yanova.
26 Mar 65, 13p FTD-TT-64-1032
TT 65-61988

Unclassified report

Unedited rough draft trans. of Russian mono.
Materialy Nauchnoi Konferentsii po Aviatsionnoi Meteorologii, n.p. p53-8 1963.

Descriptors: (*Aircraft, Stability), (*Atmospheric motion, Aeronautics), Flight, Troposphere, Probability, Numerical methods and procedures, Identification, USSR.

AD-614 060 Div. 1
CFSTI Prices: HC$2.00 MF$0.50

Harry Diamond Labs., Washington, D. C.
MEASUREMENT OF ELECTROSTATIC CHARGE ON AIRCRAFT,
by Philip Krupen and Elmer B. Rogers. 30 Dec 1964,
31p TR-1267
Projs. 36133, 36100, Task 1P010501A001

Unclassified report

Descriptors: (*Electrostatic fields, Jet planes), (*Jet planes, Electrostatic fields), Flight, Model tests, Test methods, Test equipment, Voltage, Functions, Relaxation time, Integral transforms, Tables.

The electrostatic charge on airplanes was determined from measurements of the charge induced on a large screen while the airplanes flew over it. The airplane charge was computed from a transfer function that involved the relaxation time of the sensing circuit and the passage time of the airplane. Corrections for variation in the height and displacement of the airplanes were made from laboratory measurements on scale models of the field equipment. The average charge on a jet-propelled F-86 fighter was found to be -35 .4 x 10 to the minus 6th power coulomb and on a B-26 bomber, -0.56 x 10 to the minus 6th power coulomb. The corresponding aircraft potentials are approximately -141,000 and -1200 v. (Author)

AD-614 065 Div. 1, 30
CFSTI Prices: HC$6.00 MF$1.50

Air Force Cambridge Research Labs., Bedford, Mass.
PROCEEDINGS OF THE AFCRL SCIENTIFIC BALLOON SYMPOSIUM, HELD AT BOSTON, MASSACHUSETTS, 25-27 SEPTEMBER 1963.
Air Force Surveys in Geophysics Research note.
Dec 63, 264p Rept. no. AFSG-154, AFCRL 63-919
Proj. 6665

Unclassified report

Symposium coordinated by Wentworth Inst., Bostn, Mass.

Descriptors: (*Balloons, Symposia), Test equipment, Design, Materials, Manned, Astronomy, Atmosphere, Stratosphere, High altitude, Tracking, Atmospheric sounding, Synthetic rubber, Stresses, Inflatable structures, Balloon equipment, Gondolas, Meteorological balloons, Stabilization, Abstracting.

Sixteen of the twenty papers presented at the Symposium are presented. They provide a reasonable balance between balloon-borne experiments and recent developments of balloon technology. Balloon technology presentations include plastic balloon capabilities, both in-being and proejected, current shape studies for new designs, a survey of sensing elements for the balloon environment, and the development of a new heavy load balloon material. Two balloon astronomy programs and related stabilization systems are presented, as is the case for manned balloon astronomy. Other scientific applications of balloons include atmospheric optics and atmospheric sampling programs, jet stabilization of a balloon gondola, and the ROBIN and ROSE balloon systems. Other types of balloons discussed are tethered balloons, hot air balloons, and the neoprene vertical sounding balloon. (Author)

AD-614 138 Div. 1, 9, 14
CFSTI Prices: HC$2.00 MF$0.50

Minnesota Univ., Minneapolis.
PARACHUTE STRESS ANALYSIS DURING INFLATION AND AT STEADY STATE,
by H. G. Heinrich and L. R. Jamison, Jr. 1963, 35p
Contract AF33 657 11184

Unclassified report

Prepared in cooperation with Pioneer Parachute Co., Inc., Manchester, Conn.

Presented at the AIAA Entry Technology Conference, held at Williamsburg, Va., 12-14 Oct 64.

Descriptors: (*Parachutes, Stresses), (*Parachute fabrics, Stresses), Numerical analysis, Drag, Aerodynamic loading, Elasticity, Configuration.

The stresses occurring in the cloth of a parachute during the period of inflation and under steady state are calculated for a number of instantaneous shapes which are characteristic of the opening process and the steady state. The method is general and may be applied to any type of parachute built out of solid cloth, concentric rings or ribbons. The presented analysis is related to canopies consisting of triangular gores but can be extended to other gore patterns. A numerical calculation is made for a solid flat circular parachute during the period of opening and at steady state. (Author)

AD-614 231 Div. 1
CFSTI Prices: HC$3.00 MF$0.75

Kaman Aircraft Corp., Bloomfield, Conn.
DEVELOPMENT OF A CRASHWORTHY, ARMORED, UNIVERSAL CREW SEAT FOR U. S. ARMY AIRCRAFT.
Final rept.,
by George I. Hackenberger and Wallace O. Mattenson.
Feb 65, 100p
Contract DA44 177AMC93T, Task 1D121401A1500301
TRECOM TR-65-2

Unclassified report

Descriptors: (*Army aircraft, Aircraft seats), (*Aircraft seats, Aviation safety), Armor, Safety harness, Reinforcing materials, Loading (Mechanics), Structural properties, Maintenance, Specifications, Stresses, Design.

The program to develop five experimental armored crashworthy crew seats for use in Army aircraft is described. Problems of occupant restraint, crash load attenuation, armor selection, armor coverage, mechanical system and structural system are discussed. Factors affecting universal application in existing and future aircraft are outlined. (Author)

AD-614 460 Div. 1, 9
CFSTI Prices: HC$2.00 MF$0.50

Systems Engineering Group, Research and Technology Div., Wright-Patterson AFB, Ohio.
ENVIRONMENTAL CONDITIONS TO BE CONSIDERED IN THE STRUCTURAL DESIGN OF AIRCRAFT REQUIRED TO OPERATE AT LOW LEVELS.
Rept. for Jun-Dec 64,
by William H. Austin, Jr. Jan 65, 26p
Rept. no. SEG TR-65-4

Unclassified report

Descriptors: (*Aircraft, Low altitude), (*Low altitude, Flight), (*Turbulence, Low altitude), Low-altitude bombing, Gust loads, Structural properties, Gusts, Terrain, Flight paths, Mathematical analysis, Functions, Probability, Tables, Design.

One of the greatest problems facing structural engineers at the present time is a proper definition of the turbulence-environment at low level. The power spectral density approach is considered to be the most reasonable to use in defining this environment. Presently published data, while in power spectral form, do not appear to be adequate. Because a critical need for low-level design criteria exists, low-level power spectral exceedance curves have been derived from a B-66 low-level gust study, an F-106 low-level high-intensity gust program, and B-52 fleet service experience. These data indicate that low-level lateral turbulence is from 15 to 30 percent more severe than vertical turbulence. Much additional effort is required in the area of low-level turbulence before structural engineers can have complete confidence in their low-level turbulence design criteria. (Author)

2. Astronomy, Geophysics and Geography

AD-613 914 Div. 2, 25

Sydney Univ. (Australia).
THE PROPAGATION OF ACOUSTIC WAVES THROUGH THE SOLAR CHROMOSPHERE.
Revised ed.,
by G. A. Bird. 21 Feb 64, 4p
Grant AF AFOSR299 63
AFOSR 65-0559

Unclassified report

Pub. in Astrophysical Journal (U. S.) v140 n1 p288-91 Jul 1 1964 (Copies not available to DDC or Clearinghouse customers).
Revision of manuscript submitted 6 Dec 63.

Descriptors: (*Solar atmosphere, Acoustics), (*Acoustics, Solar atmosphere), (*Astrophysics, Solar atmosphere), Gases, Shock waves, Propagation, Fluid mechanics, Mathematical analysis.

Consideration is given to the acoustic disturbances produced by a piston oscillating with the frequency and amplitude characteristic of the photospheric granules. The method of characteristics is used to obtain numerical solutions of the full non-linear equations of motion. It is found that shock waves are formed within distances of the order of 1000 km. These shock waves are expected to propagate through the chromosphere with their strengths virtually unaffected by the atmosphere. It is concluded that the results of linearized theory must be treated with caution. (Author)

AD-613 938 Div. 2, 12, 19
CFSTI Prices: HC$4.00 MF$0.75

Air Force Cambridge Research Labs., Bedford, Mass.
PROJECT ANNA OPTICAL OBSERVATIONS.
Environmental research paper,
by Paul H. Dishong and George Hadgigeorge.
Mar 65, 113p Paper no. ERP-92, AFCRL 65-195
Proj. 7600, Task 7600 03

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy available for public sale.

Descriptors: (*Navigation satellites, Optical tracking), (*Optical tracking, Navigation satellites), (*Astronomical geodesics, Satellites (Artificial)), Beacon lights, Flash lamps, Geodesics, Orbital trajectories, Position finding, Tables.

Optical observations of the first geodetic satellite (ANNA) have been made since shortly after launch of the satellite. After 27 months, active observations are still being made. This report contains all of the reducible optical observations made between 9 November 1962 and 20 January 1964 by the USAF, USC and GS, USNO and NASA. In addition, the SAO Baker-Nunn active and passive observations made during November and December 1962 are listed. Brief descriptions of the satellite, the optical beacon, and some of the problems that have arisen during data reduction are presented. Some recommended changes to optical system and data reduction procedures are included. (Author)

AD-613 956 Div. 2, 15
CFSTI Prices: HC$1.00 MF$0.50

Aeronautical Chart and Information Center, St. Louis, Mo.
GRAVITY DISTURBANCE COMPONENTS FROM A SPHERICAL HARMONIC EXPANSION OF THE DISTURBING POTENTIAL,
by B. Louis Decker. Apr 65, 22p
Technical paper no. ACIC-TP-18

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Gravity, Perturbation theory), (*Special functions (Mathematical), Gravity), Series, Geophysics, Potential theory, Differential equations, Vector analysis, Harmonic analysis.

The solution of the basic 'differential equation of gravimetry' is the disturbing potential, T. Gravity disturbance components in a local orthogonal coordinate system are obtained from the gradient of T where T is expressed in spherical coordinates r, phi, lambda. Gravity disturbance components in rectangular earth-centered, earth-fixed (ECEF) and earth-centered, inertial (ECI) reference systems are provided by a coordinate transformation. (Author)

AD-613 965 Div. 2
CFSTI Prices: HC$4.00 MF$1.00

Little (Arthur D.) Inc., Cambridge, Mass.
STUDIES OF THE PHYSICAL CHARACTERISTICS OF PROBABLE LUNAR SURFACE MATERIALS: PART II.
Final rept., pt. 2 for Oct 63-Oct 64,
ed. by P. E. Glaser. Nov 64, 134p
Contract AF19 628 421, Proj. 8602, Task 860202
AFCRL 64-970 P 2

Unclassified report

See also AD-613 018.

Descriptors: (*Lunar environment, Simulation), (*Moon, Physical properties), (*Astronomy, Lunar environment), Vacuum apparatus, Test facilities, Lunar probes, Petrology, Surface properties, Adhesion, Electrostatics, Radiation damage, Extraterrestrial topography, Powders, Thermal properties, Silicates, Synthesis (Chemistry).

This report presents the findings of theoretical and experimental studies to determine the physical properties of probable lunar surface materials in a simulated lunar environment. To accomplish these goals, the following tasks were performed: (1) Installation of two ultrahigh-vacuum systems; (2) preparation of and synthesis of materials to simulate the rock compositions most likely to be present on the moon; (3) analysis and experimentation on the surface effects on adhesion; (4) analysis and experimentation on electrostatic effects; (5) studies of radiation; and (6) analysis and measurement of thermal properties in a high vacuum. (Author)

AD-613 978 Div. 2
CFSTI Prices: HC$1.00 MF$0.50

American Meteorological Society, Boston, Mass.
OBSERVATIONAL DATA FROM THE ANNULAR SOLAR ECLIPSE OF 31 JULY 1962,
by G. S. Veisig and A. P. Molchanov. Dec 64, 7p
Rept. no. T-R-462
Contract AF19 628 3880
TT 65-61977

Unclassified report

Rezultaty Nablyudeniya Koltseobraznogo Solnechnogo Zatmeniya 31 Iyulya 1962 g, trans. of Solnechnye Dannye (USSR) n11 p58-61 1963.

Descriptors: (*Solar eclipses, Astronomical data), (*Astronomy, Solar eclipses), Sunspots, Extra-terrestrial radio waves, Electronic recording systems, Subsaharan Africa, USSR.

Observations were made at Bamako in the Republic of Mali on the central line of the eclipse at a point with coordinates lambda = 8 deg 00 min 06 sec W, phi = 12 deg 38 min 03 sec N, at 320 m above sea level. Information reported indicates that the following active formations were on the sun on eclipse day and may have been associated with an increase in radio emission: four flocculi with an intensity of 1 and one flocculus with an intensity of 3. The coronal lines were weak and there were no sunspots or pores, but on the day before the eclipse the group of spots labeled No. 113 with a total area S sub p = 12 was observed within the limits of the intense flocculus (the maximum value S sub p = 92 was observed on 22 July). This group had disintegrated by eclipse time, but their source did continue to emit at lambda 3.16 cm. The location of the source is marked on a figure, which also contains a synoptic map of the sun, the path of the moon, and the graphs of the eclipse (ephemeris time).

AD-613 979 Div. 2, 30
CFSTI Prices: HC$1.00 MF$0.50

American Meteorological Society, Boston, Mass.
CALIBRATION OF RADIOSONDES AT TEMPERATURES TO MINUS 100 DEGREES C,
by A. E. Shchekin. Nov 64, 8p Rept. no. T-R-458
Contract AF19 628 3880
TT 65-61978

Unclassified report

Graduirovka Radiozondov do Temperatury Minus 100 degrees, trans. of Meteorologiya i Gidrologiya (USSR) n6 p49-51 1964.

Descriptors: (*Radiosondes, Calibration), (*Meteorological instruments, Radiosondes), Atmospheric temperature, Temperature sensitive elements, Low-temperature research, Standardization, Test equipment, Cooling, Alcohols, Aromatic compounds, Carbon dioxide, Solidified gases, Sublimation, USSR.

A method and apparatus to calibrate the thermistors of radiosondes are described. The method is based on cooling alcohol and toluene to -95 to -100C and a method for checking the readings of test thermometers at these temperatures against reference points. The method utilizes the familiar relationship between the sublimation point of dry ice and the external pressure.

AD-613 981 Div. 2
CFSTI Prices: HC$1.00 MF$0.50

American Meteorological Society, Boston, Mass.
USE OF RADIO DATA TO DETERMINE THE POSITION OF THE REGION IN WHICH THE CHARACTERISTICS OF THE SOLAR ATMOSPHERE CHANGE RAPIDLY,
by A. P. Molchanov. Dec 64, 8p
Rept. no. T-R-460
Contract AF19 628 3880
TT 65-61980

Unclassified report

Opredelenie Polozheniya Oblasti Bystrogo Izmeneniya Kharakteristik Solnechnoi Atkosfery po Rezultatam Radioastronomicheskikh Nablyudenii, trans. of Akademiya Nauk SSSR. Doklady v158 n2 p302-4 1964.

Descriptors: (*Radio astronomy, Solar atmosphere), (*Solar atmosphere, Radio astronomy), (*Astrophysics, Solar atmosphere), Solar eclipses, Optical scanning, Correlation techniques, Astronomical data, USSR.

The radio radius of the sun r sub 1 (relative to the results of the photosphere r sub 2) is determined from radio observations of solar eclipses by finding the difference between the moments of contact of the lunar and solar disks recorded by radio and optical methods. This involves observations of the second and third contacts, near which the occulted area of the solar disk changes much more rapidly and r sub 2 can be determined much more precisely than when the first and fourth contacts are used. The data of several solar eclipses were used to determine r sub 1.

AD-613 982 Div. 2
CFSTI Prices: HC$4.00 MF$1.00

American Meteorological Society, Boston, Mass.
IRREGULARITY STRUCTURE AND MOVEMENT IN THE IONOSPHERE (SELECTED PASSAGES),
by S. F. Mirkotan and Yu. V. Kushnerevskii.
Dec 64, 129p Rept. no. T-RC-23
Contract AF19 628 3880
TT 65-61981

Unclassified report

Neodnorodnaya Struktura i Dvizhenie v Ionosfere, trans. of Issledovaniya Ionosfery i Meteorov: Sbornik Statei (USSR) n12 p10-32 74-88 109-39 152-9 1964.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Ionosphere, Physical properties), (*Atmospheric sounding, Ionosphere), Scientific organizations, Scientific research, Ionospheric propagation, Radio waves, Atmospheric motion, Radio equipment, Correlation techniques, Meteorology, USSR.

Contents: Results of observations made during the IGY; Frequency-separated reception and its combination with spatial separation; Method of complete correlation analysis; Volumetric correlation analysis.

AD-613 988 Div. 2, 1
CFSTI Prices: HC$6.00 MF$1.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
CLIMATE OF THE FREE ATMOSPHERE,
by N. F. Nakorenko and F. G. Tokar. 9 Feb 65,
268p FTD-MT-63-339
TT 65-61986

Unclassified report

Klimat Svobodnoi Atmosfery, edited machine trans. of Klimat SSSR n8 p1-220 1959.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Climatology, USSR), (*Atmospheric sounding, USSR), Atmospheric motion, Meteorology, All-weather aviation.

The climate of the free atmosphere above the USSR is described to a height of 15 km. over 5 consolidated regions. The peculiarity of the distribution of main meteorological elements and their potential at heights are presented. The characteristics of cloudiness and the conditions favoring icing are described. This monograph is intended for satisfaction of the demands of aviation and for use in synoptic practice. It can be applied by students of universities and special secondary educational institutions as a training aid. (Author)

AD-613 991 Div. 2, 13, 22
CFSTI Prices: HC$2.00 MF$0.50

Naval Civil Engineering Lab., Port Hueneme, Calif.
LATERAL-PLATE TESTS WITH PLATE DIAMETER VARIED,
Interim rept. for Aug-Oct 64,
by H. L. Gill and T. J. Garcia. Apr 65, 35p
Technical rept. no. R-374
Proj. Y F015 15 01 009

Unclassified report

Descriptors: (*Soil mechanics, Loading (Mechanics)), (*Sand, Soil mechanics), Beaches, Moisture, Nuclear explosions, Blast, Metal plates, Pressure, Stability, Tests, Test facilities, Structures, Analysis.

To further the understanding of the mechanics of soil resistance to horizontal loading, a series of lateral-plate bearing tests was performed in the pit of the NCEL atomic-blast simulator. These tests were a continuation of an earlier test program which considered one plate diameter in one type of soil; during this series of tests, three plate diameters were used, and the results were compared with data from previous tests. In addition, one test was performed with a different type of soil in an attempt to generalize the applicability of the test results. To simulate a variation in the depth of burial of the plate, overburden pressures were applied to the soil surface by a pneumatic bag. Included in the information gained from this series of tests was the fact that the coefficient of horizontal subgrade reaction, k sub h, decreased exponentially with increasing plate deflection and increased exponentially with increasing overburden pressure for all plate diameters. In addition, it was found that plate deflection at a given level of unit load on the plate did not vary directly with plate diameter as has been previously assumed, but was directly proportional to the 1.35 power of plate diameter. In other words, although k sub h increases with increasing overburden pressure and decreases with increasing plate deflection for all plate diameters considered, at a given level of pressure on the plate, k sub h was found to be inversely proportional to plate diameter raised to the 1.35 power. (Author)

AD-614 012 Div. 2, 8
CFSTI Prices: HC$2.00 MF$0.50

Rhode Island Univ., Kingston.
RESULTS OF SIMULTANEOUS ELF MEASUREMENTS AT BRANNENBURG GERMANY AND KINGSTON, R. I.
Scientific rept. no. 3 (Final rept., pt. 1)
15 Jun 60-14 Jan 65,
by T. J. Keefe and C. Polk. 15 Jan 65, 28p
Rept. no. 7252/3
Contract AF19 604 7252, Proj. 4603, Task 460313
AFCRL 65-200 P1

Unclassified report

Prepared in cooperation with H. L. Konig, Technische Hochschule, Munich, Germany.

Descriptors: (*Atmospherics, Terrestrial magnetism), (*Terrestrial magnetism, Ionospheric propagation), (*Electromagnetic fields, Diurnal variations), (*Radio waves, Terrestrial magnetism), Extremely low frequency, Solar disturbances, Ionosphere, Noise, Thunderstorms, Radio waves, Propagation, West Germany, United States, Oscillations.

A series of measurements of the horizontal magnetic field in the 5 to 15 cps frequency range were performed in Kingston, R. I., U.S.A., and Brannenburg, Germany between May, 1963 and June, 1964. These two locations are separated in distance along the earth's surface by approximately 4000 miles; their respective coordinates are lat. 41 deg.30 min. North, long 71 deg. 32 min. West (Kingston) and lat. 47 deg. 26 min. North, long. 12 deg. 03 min. East (Brannenburg). Simultaneous readings on paper tape running at 25 mm/sec obtained on 30 different dates for a total of approximately 321 minutes indicate that some ELF bursts were received simultaneously and must have originated from a common source; most of the time, however, the records at the two stations were not similar in appearance. The rectified output of a narrow filter about the frequency range of the first Schumann resonance (7.5 - 10 cps) was recorded continuously at both stations over periods of several months. Recordings at the two locations exhibit very similar diurnal variation if the data are referred to local time. (Author)

AD-614 018 Div. 2, 9
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
ON THE PROPAGATION OF A SHOCK WAVE IN THE GROUND DURING IMPACT OF A VERY FAST METEORITE AGAINST THE SURFACE OF THE PLANET,
by Yu. P. Raizer. 26 Mar 65, 11p
FTD-TT-64-1038
TT 65-61990

Unclassified report

Unedited rough draft trans. of Meteoritika (USSR) v24 p82-6 1964.

Descriptors: (*Meteorites, Landing impact), (*Shock waves, Propagation), Impact shock, Planets, Hydrodynamics, Incompressible flow, Mathematical analysis, Astronomy, USSR.

The purpose of this report is to show how a hydrodynamic process take place, to establish some of its general rules and explain the results of approximate solution of the problem about the propagation of a shock wave in a gas at centered impact along its surface (at 'point' explosion on the surface). These results appear to indicate that the law of shock wave damping is very close to the law of damping at an explosion in an unlimited medium.

AD-614 021 Div. 2, 30
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
FORMULATION OF TRAJECTORIES OF AIR PARTICLES WITH THE AID OF ELECTRONIC COMPUTERS,
by A. I. Burtsev and I. P. Vetlov. 26 Mar 65, 18p
FTD-TT-64-1039
TT 65-61993

Unclassified report

Unedited rough draft trans. of Tsentral'nyi Institut Prognozov. Trudy (USSR) v128 p46-55 1963. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Air mass analysis, Programming (Computers)), (*Programming (Computers), Air mass analysis), Weather forecasting, Trajectories, Atmospheric motion, Time, Digital computers, USSR.

A method is described of formulating diagnostic trajectories of air particles with the aid of electronic computers. The advantage of this method in comparison with the synoptic method of formulating trajectories lies in the fact, that it considers more accurately the wind changes in time and space. A system is proposed of compiling prognostic trajectories on the surface of 700 mb with the use of data gained by observing the wind at initial moment of time. (Author)

AD-614 043 Div. 2
CFSTI Prices: HC$1.00 MF$0.50

Naval Oceanographic Office, Washington, D. C.
GEOMAGNETIC SURVEY INFORMATION.
Brochure no. 2.
Mar 65, 20p

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Terrestrial magnetism, Hydrographic surveying), Maps, Marine geophysics, Bibliographies, Magnetometers, Shipborne, Airborne.

This brochure contains index charts and brief descriptions of geomagnetic surveys. Information on the availability of Technical Reports, other publications, and work in progress is also presented. It is anticipated that this information will be brought up to date annually. On all surveys, both airborne and shipboard navigation uncertainty may introduce errors in the magnetic data presentation. The magnitude of data errors varies and is dependent on the navigation error and the magnetic gradients in the survey area.

AD-614 056 Div. 2, 8, 25

Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
OPTICAL SCINTILLATION; A SURVEY OF THE LITERATURE,
by Jurgen R. Meyer-Arendt and Constantinos B. Emmanuel. 5 Apr 65, 146p
Technical note no. TN-225

Unclassified report

Available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.70, as C13.46:225.

Descriptors: (*Light, Atmospheric refraction), (*Atmospheric refraction, Light), (*Optical phenomena, Atmospheric refraction), Reviews, Atmosphere, Stars, Extraterrestrial radio waves, Diffraction, Refraction, Scattering, Absorption, Statistical analysis.

The effects of atmospheric refraction on the propagation of electromagnetic radiation at optical frequencies are discussed. Numerous observational, experimental, and theoretical aspects of random refraction, that is, of scintillation in its widest sense, are discussed. The following topics are dealt with: refraction in plane and in spherically stratified media, refractive index variations, radio refraction, scintillation as a function of aperture size, zenith distance, site location, dispersion, and meteorological conditions, the frequency spectrum of scintillation, terrestrial scintillation, image distortion and contrast reduction, refraction and diffraction theories of scintillation, autocorrelation analyses, radio star scintillation, and coherence problems. Questions of atmospheric scattering, absorption, and depolarization are excluded. Finally, a brief review is given concerning newer experimental methods for the observation, recording, and analysis of optical scintillation, including suggestions as to what further theoretical and experimental efforts should be undertaken. (Author)

AD-614 079 Div. 2, 16
CFSTI Prices: HC$3.00 MF$0.75

Wisconsin Univ., Madison. Dept. of Meteorology.
THE ROLE OF PHYSIOLOGY AND ENVIRONMENT IN THE DISTRIBUTION OF ARCTIC PLANTS,
by James A. Larsen. Nov 64, 74p
Technical rept. no. TR-16
Contract Nonr120207, Proj. NR387 022

Unclassified report

Descriptors: (*Plants (Botany), Arctic regions), (*Arctic regions, Plants (Botany)), Ecology, Physiology, Distribution, Terrain, Temperature, Photosynthesis, Respiration, Nutrition, Nitrogen, Morphology (Biology), Adaptation (Physiology), Meteorological parameters, Carbohydrates, Permafrost, Growth.

Conclusions: Physiology, environmental response, and the range of plant species in the arctic are all interrelated phenomena, no one of which can be described effectively without reference to the others. In general, the arctic environment supplies low amounts of precipitation, but correspondingly low evaporation rates are also the rule due to low temperatures. Both solar and thermal radiation supplies are low. Wind velocities are relatively high. The perennially frozen ground has an important effect, both in regard to temperature and to induced soil movement. Temperature influences are both important and complex. Conventional meteorloological data are misleading because plant temperatures and soil surface temperatures are often higher by several degrees, or even tens of degrees, than the air at the six foot level. The effects upon such physiological processes as mineral absorption, diffusion, transpiration, and so on, are significant to such an extent that arctic plants often can be shown to have developed special metabolic adaptations to low temperature. Notable among these special adaptations are the characteristics of protoplasm which renders it unusually frost hardy and permits continuation of growth or flowering in spring even after interruption of normal development by freezing. From available evidence, the respiration rate of arctic plants is higher than that of plants from warmer latitudes and environments when comparisons are made under identical temperatures and other environmental conditions. (Author)

AD-614 085 Div. 2
CFSTI Prices: HC$2.00 MF$0.50

Geophysics Corp. of America, Bedford, Mass.
MODEL ATMOSPHERES DETERMINED BY ABSORPTION OF SOLAR RADIATION,
by Raymond A. Minzner. Oct 64, 44p
Technical rept. no. GCA-TR-64-13-A, SR-6
Contracts AF19 628 1633, NASw976, Proj. 7673,
Task 76731
AFCRL 64-874

Unclassified report

Descriptors: (*Atmosphere models, Solar radiation), (*Solar radiation, Atmosphere models), Ultraviolet radiation, Absorption, Atmosphere, Scale, Height finding, Kinetic theory, Data processing systems, Iterative methods.

Atmospheric models consisting of altitude profiles of total scale height, number density of each of a number of constituents, and temperature may be computed from values of incident UV radiation, and a set of boundary conditions at a reference level near 150 km where the optical depth for the absorbed radiation is near unity and where the number density of each of the individual gas species is known. The method is an iterative one requiring machine calculation and has not yet been implemented. The method is based on rigorous equations relating total scale height versus altitude to the summation terms involving the absorption and reradiation profiles of the total atmosphere in narrow band increments. It has also been shown that if the absorption in some narrow band or line is the result of a single species and the absorption profile is known from h to the

'top' of the atmosphere, the scale height profile for that species and the kinetic temperature profile are known from h to the 'top' of the atmosphere. (Author)

AD-614 097 Div. 2
CFSTI Prices: HC$2.00 MF$0.50

Woods Hole Oceanographic Institution, Mass.
INERTIAL BOUNDARY CURRENT OF SIMILARITY TYPE IN HOMOGENEOUS AND STRATIFIED OCEANS.
Technical rept.,
by Pierre Welander. Mar 65, 41p Ref-65-19
Contract Nonr219600, Proj. NR083 004
Unclassified report

Descriptors: (*Ocean currents, Theory), Boundary layer, Moment of inertia, Gulf stream, Ocean models, Boundary value problems, Fluid mechanics.

A theoretical study is made of inertial boundary currents in a model ocean. A similarity transformation is introduced, assuming a uniform profile across the current, either horizontally or vertically. This reduces the problem to one described by ordinary differential equations. In the case of a two-dimensional, homogeneous ocean, the solutions can be given in closed form. They give boundary currents that either decay directly away from the boundary, or boundary currents with a counter-current just at the wall. The currents can go both north and south, and do exist at eastern as well as western boundaries. All interior flow is westward. In the three-dimensional, stratified case, the nature of the solution is investigated by looking at expansions valid near and far from the boundaries. Generally, one finds that a north-going current can exist at a western boundary, a south-going current at an eastern boundary. Two types of similarity transformations are used. One leads to a boundary current with outflow to the interior, in the western boundary case, the other to a current with constant transport. (Author)

AD-614 100 Div. 2, 15
CFSTI Prices: HC$3.00 MF$0.75

Iowa State Univ., Iowa City.
AN INTERPLANETARY DIFFUSION MODEL FOR THE TIME BEHAVIOR OF INTENSITY IN A SOLAR COSMIC RAY EVENT,
by S. M. Krimigis. 1 Apr 65, 63p
Rept. no. 65-7
Contract Nonr150906; Grant NsG233 62
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Cosmic ray bursts, Diffusion), (*Solar radiation, Cosmic ray bursts), Mathematical models, Magnetic fields, Planets, Protons, Particle trajectories, Scattering, Numerical methods and procedures, Fourier analysis.

It is found possible to give a coherent interpretation of the time history of the intensity of several solar cosmic ray events in terms of a unified interplanetary diffusion model which assumes that the diffusion coefficient D = M r to the B power, where r is the heliocentric radial distance and M and B are parameters, which may be dependent on particle energy E. The model is particularly successful in accounting for the decay phases. For the September 28, 1961 event M varies as E to the 0.33 power and, assuming spherical geometry, B is equal to one for 55 < E < 500 MeV and decreases rapidly at lower energies. At r = 1 A.U. the mean free path lambda is about 0.081 A.U. for E = 200 MeV and 0.15 for E = 23 MeV. The energy dependences of B and lambda suggest 0.006 A.U. as the order of magnitude of the scale size of irregularities in the interplanetary magnetic field. The source spectrum is inferred. The possibility of non-spherical geometry of diffusion is considered, as is the implication of the results with respect to the solar modulation of galactic cosmic radiation. (Author)

AD-614 101 Div. 2
CFSTI Prices: HC$3.00 MF$0.75

Iowa State Univ., Iowa City.
GEOGRAPHIC CHARTS AND ALTITUDE PLOTS FOR SELECTED VALUES OF GEOMAGNETIC SHELL PARAMETERS B AND L,
by Bharathi Venkatesan. Mar 65, 59p
Rept. no. 65-8
Contracts Nonr150906, N9onr93806
Unclassified report

Descriptors: (*Terrestrial magnetism, Mapping), Geophysics, Graphics, Magnetic fields, Configuration.

Using the Jenson and Cain (1963) coefficients for the geomagnetic field for the epoch 1960, and McIlwain's B-L Program, a grid of values of B and L were computed for the altitudes 0, 100, and 1000 km, for the latitude belt 70 degrees N to 70 degrees S in steps of 2 degrees for the latitudes and 5 degrees for the longitudes. Interpolations give the iso-contours for selected values of L and B at these three heights. These are shown in maps. A map which gives the plot of iso-contours of L on the surface of the earth as seen from the North and South Poles is presented. An extension of the B-L Grid to the remaining altitudes up to 2000 km in steps of 100 km is carried out. However, a latitude interval of 5 degrees and a longitude interval of 10 degrees are adopted. The computations are also extended beyond 70 degrees latitude for some chosen longitudes necessitated by the following study. For the study of the drift of trapped particles around the earth, a useful work would be to plot iso-contours of constant B and L. The altitudes for any particular combination of B and L are plotted as a function of longitude. Maps showing such plots for the Southern and Northern Hemispheres are presented.

AD-614 105 Div. 2, 24
CFSTI Prices: HC$1.00 MF$0.50

Army Engineer Research and Development Labs., Fort Belvoir, Va.
THE PHOTOGRAMMETRIC PARAMETERS OF THE CAMERA OF A PHOTOGRAPHIC APPARATUS,
by G. V. Romanovskii. 1965, 14p
Rept. no. T-1765-65
TT 65-62034
Unclassified report

Trans. of Geodeziya i Kartografiya (USSR) n7 p34-46 1964.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Photogrammetry, Correlation techniques), (*Photographic equipment, Photogrammetry), Stereoscopic photography, Surveying, Position finding, Photographs, Mapping.

By these parameters are meant the constants of the apparatus that must be known for photogrammetry by reference to photographs taken with that apparatus. The precise process determines which parameters must be known, and with what accuracy. For instance, photographs of a plain locality provided with four reference points

can be transformed without knowledge of any apparatus parameter. The most precise and most advanced methods in stereophotogrammetric surveying require the determination of the largest number of parameters, and with high accuracy. The requirements for determining the parameters of the most precise stereophotogrammetric methods are considered here.

AD-614 106 Div. 2, 14, 24
CFSTI Prices: HC$1.00 MF$0.50

Army Engineer Research and Development Labs., Fort Belvoir, Va.
USE OF TRANSPARENT PLASTICS IN STEREOTOPOGRAPHIC WORK,
by M. A. Blyumin. 1965, 5p Rept. no. T-1769-65
TT 65-62035

Unclassified report

Trans. of Geodeziya i Kartografiya (USSR) n7 p49-52 1964.

Descriptors: (*Plastics, Mapping), (*Mapping, Plastics), (*Stereoscopic map plotters, Plastics), Transparent panels, Maps, Topography, Map projection, Photogrammetry, USSR.

A brief description is given of three distinct uses of plastics in the compilation of maps on universal instruments: (1) direct engraving of a publisher's original in an engraving coating, with separation as regards map content (relief, contours, hydrography); (2) engraving of a compiler's original (without separation); and (3) production of a compiler's sketch original that serves as basis for engraving a publisher's original.

AD-614 107 Div. 2
CFSTI Prices: HC$1.00 MF$0.50

Army Engineer Research and Development Labs., Fort Belvoir, Va.
THE USD-1 DROBYSHEV UNIVERSAL STEREOGRAPH,
by I. B. Ilyin. 1965, 8p Rept. no. T-1762-65
TT 65-62036

Unclassified report

Trans. of Geodeziya i Kartografiya (USSR) n6 p46-53 1964.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Stereoscopes, Photogrammetry), (*Photogrammetry, Stereoscopes), Aerial photography, Geodesics, Photographic equipment, USSR, Mapping, Position finding.

The USD-1 provides exact fixes for aerial photographs with angles of inclination up to 3 degrees, because the centers of rotation of the correction planes pass through the point of zero distortion on the photograph and also because special correction plates are used. These latter provide correction of the azimuthal distortion arising from the horizontal position of the photograph in the instrument. The detailed theory of the universal stereograph is to be found in Drobyshev's book ((Principles of Aerial Photography and Photogrammetry). Moscow, Gosgeoltekhizdat, 1963.) The USD-1 can handle photographs corresponding to f of 55 to 200 mm; the angles alpha and omega can range up to 2 degrees for f = 55 mm and 3 degrees for f > 55 mm. The scale of the model produced in the instrument is 1.3 times that of the photographs. The focal length F is 140 mm.

AD-614 117 Div. 2
CFSTI Prices: HC$0.70 MF$0.50

Naval Oceanographic Office, Washington, D. C.
A STUDY OF AEROMAGNETIC DATA, NEW ENGLAND SEAMOUNT AREA,
by A. L. Kontis and G. A. Young. Mar 65, 25p
Rept. no. TR-166

Unclassified report

Descriptors: (*Terrestrial magnetism, Atlantic Ocean), (*Marine geophysics, Terrestrial magnetism), Airborne, Magnetometers, Marine geology, Mapping.

A detailed aeromagnetic survey of a 38,000 square mile area off the coast of New England was conducted by the Oceanographic Office in 1957. The survey area contains the continental shelf, slope and rise related to Georges Bank, and the northwest end of the New England-Bermuda seamount chain. Analysis of the survey data indicates that the features included in the group extending from Kelvin to Bear seamounts are highly magnetized, in the order of 0.01 cgs units, and that the seamounts have little sedimentary cover. The nature of the magnetic anomalies over the seamounts extending from Panulirus to Mytilus indicates that these features are composed of a less magnetic material. Based on the correlation between magnetic anomalies and bottom features, it is probable that the survey area contains several seamounts or seaknolls that are at present uncharted. The anomalies over the continental margins are linear in form and reflect structural trends and possible faulting in the basement beneath Georges Bank. (Author)

AD-614 135 Div. 2
CFSTI Prices: HC$1.00 MF$0.50

Minnesota Univ., Minneapolis.
PROPER MOTIONS FOR EIGHTY WIDE DOUBLE STARS,
by Willem J. Luyten. 1963, 11p
Contract Nonr189200, Proj. NR046 752

Unclassified report

Publications of the Astronomical Observatory, University of Minnesota, v3 n12.

Descriptors: (*Binary stars, Celestial mechanics), (*Celestial mechanics, Binary stars), Motion, Astronomical data, Stars.

Determinations of proper motions of eighty wide double stars are used to decide whether the pairs are physically or optically double. Old and new positions were determined from the Astrographic Catalogue and t Palomar National Geographic Survey plates respectively

AD-614 155 Div. 2

Massachusetts Inst. of Tech., Cambridge.
ON THE OSCILLATIONS OF THE MACLAURIN SPHEROID BELONGING TO THE THIRD HARMONICS,
by S. Chandrasekhar and Norman R. Lebovitz.
23 Jan 63, 10p
Contract AF49 638 42
AFOSR 4611

Unclassified report

Prepared in cooperation with Chicago Univ., Ill.,
Contract Nonr212124
Pub. in Astrophysics Journal v137 n4 p1162-71 May 1963
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Astrophysics, Equations), (*Spheres, Harmonic oscillators), Frequency, Oscillation, Celestial mechanics.

The characteristic frequencies of oscillation of the Maclaurin spheroid belonging to the third harmonics are found. Two further points of neutral stability, beyond the first at eccentricity e = 0.81267, are isolated. They occur at e = 0.89926 and e = 0.96937; it is the second of these that is the analogue of the point of bifurcation along the Jacobian sequence. (Author)

AD-614 156 Div. 2, 9, 25

Chicago Univ., Ill.
ON THE STABILITY OF THE JACOBI ELLIPSOIDS,
by S. Chandrasekhar and Norman R. Lebovitz.
23 Jan 63, 22p
Contracts Nonr212124, AF49 638 42
AFOSR 4612

Unclassified report

Pub. in Astrophysical Journal v137 n4 p1142-61 May 15 1963 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ellipsoids, Stability), Oscillation, Center of mass, Incompressible flow, Potential theory, Equations of state, Special functions (Mathematical).

In this paper the problem of the small oscillations of the Jacobi ellipsoids is solved, and all the characteristic frequencies belonging to the second and the third harmonics are found. In particular, the variation, along the Jacobian sequence, of the characteristic frequency with respect to which the Jocobi ellipsoid becomes unstable is exhibited. (Author)

AD-614 160 Div. 2, 4, 25

Westinghouse Research Labs., Pittsburgh, Pa.
ELECTRON-ION RECOMBINATION IN NITROGEN,
by W. H. Kasner and Manfred A. Biondi. 17 Aug 64, 13p
Contract DA36 034ORD2939
AROD 3511:2

Unclassified report

Pub. in Physical Review v137 n2A pA317-29 Jan 18 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ionosphere, Recombination reactions), (*Nitrogen, Recombination reactions), (*Recombination reactions, Ionosphere), Microwave spectroscopy, Mass spectroscopy, Absorption spectrum, Glow discharges, Neon, Gas ionization, Ions, Electrons, Reaction kinetics, Electron density, Atomic energy levels.

Combined microwave, mass spectrometric, and optical techniques were used to study the afterglow decay of electrons, ions, and excited atoms from microwave discharges in nitrogen-neon gas mixtures under conditions where N2(+) is the only significant afterglow ion, i.e., at nitrogen pressures less than 0.005 Torr. Optical absorption studies show that neon-metastable atoms, an undesirable ionization source, are present in the afterglow, the concentration being inversely related to the discharge pulse length. Under conditions of no detectable metastable-atom concentration and for neon pressures in the range 15 to 30 Torr, the afterglow decay is controlled by the recombination of N2(+) ions and electrons, yielding a recombination coefficient of (2.9±0.3)X10 to the -7 power cu. cm./sec. The variation of the metastable decay rate with nitrogen pressure gives a cross section of (5.4±1.0) X10 to the -16 sq. cm. for the de-excitation of the (3)P2 neon-metastable state by nitrogen molecules. At higher nitrogen pressures and shorter discharge pulse lengths (25-50 microsec) the recombination controlled afterglows are dominated by N4(+) ions, the resulting recombination coefficient being approximately 0.000002 cu. cm/sec. All values refer to a temperature of 300K. (Author)

AD-614 161 Div. 2, 8

Air Force Cambridge Research Labs., Bedford, Mass.
IONOSPHERIC AND TROPOSPHERIC SCINTILLATIONS OF A RADIO STAR AT ZERO TO FIVE DEGREES OF ELEVATION.
Environmental research papers,
by John P. Castelli, Jules Aarons, and Herbert M. Silverman. 6 Jun 64, 26p
Paper no. 89, ARCRL 65-132
Proj. 4643, Task 464302

Unclassified report

Pub. in Journal of Atmospheric and Terrestrial Physics v26 p1197-1213 1964 (Copies available only to DDC users).

Descriptors: (*Radio astronomy, Atmospheric refraction), (*Atmospheric refraction, Extraterrestrial radio waves), Ionosphere, Troposphere, Very high frequency, Microwave frequency, Parabolic antennas, Stars, Electron density, Atmospheric sounding.

Using Cygnus A as the source, a multi-frequency study of both scintillation rate and index was made in 1961 and 1962. Using an 84 ft parabola, simultaneous observations were made at 63, 112, 225, 1200, and 2980 Mc/s with angles of elevation from 0 to 5 degrees. Tropospheric scintillation rates at 1200 and 2980 Mc/s increase as the angle of elevation increased; the mean scintillation rates rose from 1x00/min at 1 degree of elevation to 1x75/min at 3 degrees of elevation. Scintillation indices decreased with increasing angle of elevation at 1200 and 2980 Mc/s; fitting a curve of the slant range to the irregularities to the data points yielded a best fit in the 1-2 km height region. Ionospheric scintillations at 63 and 112 Mc/s showed a wavelength dependence less than lambda; a comparison of 112 and 225 Mc/s data showed a closer approximation to a first power dependence. The hypothesis advanced for poor correlation of theoretical wavelength dependence and data is that the ray path traverses the auroral region and strong scattering results. Zenith angle variation shows a dependence between z (sec i) to the 1/2 power, the near zone case and (sec i) to the 1/2 power, the far zone regime. Differences in indices for Cygnus rise and Cygnus set on the longer wavelengths are attributed to the difference in the magnetic dip angle of the set and the rise positions; higher indices were observed for Cygnus set in the direction of the magnetic declination of 16 degrees W. (Author)

AD-614 168 Div. 2

Enrico Fermi Inst. for Nuclear Studies, Univ. of Chicago, Ill.
DISCUSSION OF PAPER BY E. J. STEGELMANN AND C. H. von KENSCHITZKI, 'ON THE INTERPRETATION OF THE SUDDEN COMMENCEMENT OF GEOMAGNETIC STORMS',
by E. N. Parker and A. J. Dessler. 1 Apr 64, 4p
Grant AF AFOSR521 64, Proj. 9774, Task 977402
AFOSR 65-0509

Unclassified report

Pub. in Journal of Geophysical Research (U. S.) v69 n17 p3745-8 Sep 1 1964 (Copies not available to DDC or Clearinghouse customers).
Prepared in cooperation with Rice Univ., Houston, Tex.

Descriptors: (*Magnetic storms, Magnetohydrodynamics), Solar wind, Geophysics, Terrestrial magnetism, Propagation.

Stegelmann and von Kenschitzki state that rays computed from Fermat's principle cannot be taken literally for waves with periods above about 1 sec, because the wavelengths for these waves are larger than the distance over which the propagation velocity changes appreciably

in the region of maximum hydromagnetic velocity. On the basis of ray tracing, only a small region at the subsolar point contributes to the initial rise of the sudden commencement, owing to the enormous refraction that takes place as the ray approaches the hydromagnetic velocity maximum. It clearly contradicts the general principle that the pressure on the entire boundary contributes to the compression; nevertheless it is suggested that a consideration of propagation time of hydromagnetic disturbances can lead to an understanding of phenomena like delay times and earlier arrival of sudden commencements at medium and high latitudes, and even a rough understanding of rise times. Parker and Dessler support this theory and conclude that the major part of the rise time of the sudden commencement at any point on the surface of the earth can be estimated from the hydromagnetic propagation times. But ray tracing breaks down, and more powerful methods must be employed to advance beyond the present state of approximate estimates.

AD-614 169 Div. 2

Lunar and Planetary Lab., Univ. of Arizona, Tucson.
A MODEL OF THE LUNAR SURFACE,
by Thomas Gehrels. 18 Oct 64, 6p
Grant Nonr G00075 64

Unclassified report

Pub. in Icarus (U. S.) v3 n5 p491-6 Dec 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Extraterrestrial topography, Moon), (*Moon, Surface properties), Models (Simulations), Particles, Dust.

As a working hypothesis it is proposed that the lunar subsurface is smooth and firm with little or no dust and that it has an overlying cloud of 0.06 mm thickness consisting of ionized accreted interplanetary particles spaced at 8 microns with radius 0.8 microns. (Author)

AD-614 170 Div. 2

Arizona Univ., Tucson.
WAVELENGTH DEPENDENCE OF POLARIZATION. III. THE LUNAR SURFACE,
by T. Gehrels, T. Coffeen, and D. Owings.
26 Jun 64, 27p
Grant Nonr G00075 64

Unclassified report

Pub. in Astronomical Journal v69 n10 p826-52 Dec 1964.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Lunar environment, Optical properties), (*Moon, Optical properties), (*Astronomy, Moon), Optical scannning, Polarization, Astronomical data, Tables, Graphics.

Photoelectric measurements of brightness and polarization were made on various lunar regions, using diaphragms about 10 sec of arc in diameter. The color index of lunar regions increases with phase angle alpha; a typical relation is B-V=+0.84+0.0017 (alpha). Brightness-phase relations all show a nonlinear surge close to zero phase; this 'opposition effect' may be as much as a factor of 2 brightness increase from ±5 degrees to 0 degree 0 phase I so, the full moon has V = - 13.35 mag.±0.06 (p.e.), and the geometric albedo at 5400 A is 21% with the maria having 13% and the highlands 27%; the uncertainty is mostly due to luminescence. Luminescence was detected in the photometry and independently confirmed by the polarimetry. In 1956/59 the luna surface was 10-20% brighter than in 1963 November/1964 January. The effect was fairly constant from day to day; it probably varies with the solar cycle. Polarization-phase curves, with a filter at 0.54 micron were found to be similar to those of Lyot, while at 0.36 micron the polarization generally was greater and at 0.94 micron smaller. Gradual rotation of the polarization position angle, as reported in the literature, was not found; to within ±3 degrees precision, the electric vector maximum was either perpendicular to the plane of scattering, or lay in that plane. The opposition effect is reproduced by the theoretical photometric functions derived by Hapke (J. Geophys. Res. 68, 4571, 1963) for a tenuous surface texture, but a volume density of only 0.5% is indicated. The texture is remarkably uniform over the lunar globe, and it is similar to that of the asteroids.

AD-614 188 Div. 2

Army Cold Regions Research and Engineering Lab., Hanover, N. H.
SOME CHARACTERISTICS OF BLACK SPHERULES,
by Chester C. Langway, Jr., and Ursula B. Marvin.
1964, 19p

Unclassified report

Pub. in Annals of the New York Academy of Sciences v119 n1 p205-23 Nov 11 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Minerals, Analysis), Meteorites, Spheres, Particles, Density, Magnetic properties, Greenland, Chemical analysis, Microanalysis. Welds, Sources, Dust.

Black spherules are a common constituent of the dust samples collected from many environments in the search for extraterrestrial particles. The results are presented of a comparative investigation of the chemical composition, mineralogy, and physical properties of black spherules from the Greenland Ice Sheet and industrial black spherules variety: weld spatter. (Author)

AD-614 189 Div. 2

Laboratory of Climatology, C. W. Thornwaite Associates, Centerton, N. J.
COASTAL STORMS OF THE EASTERN UNITED STATES,
by John R. Mather, Henry Adams, III, and Gary A. Yoshioka. 17 Jun 64, 15p Technical rept. no. TR-2
Contract Nonr404300, Proj. NR388 073

Unclassified report

Pub. in Journal of Applied Meteorology v3 n6 p693-706 Dec 1964 (Copies not available to DDC or Clearinghouse customers)
Revision of manuscript submitted 15 Apr 64.

Descriptors: (*Storms, Seacoast), (*Marine meteorology, Storms), Tropical cyclones, Ocean waves, Damage, Beaches, United States, Atlantic Ocean.

Storms resulting in damage to the East Coast of the United States over the past 42 years have been classified into eight different synoptic situations: hurricanes; wave developments well east of the southeast coast or in the vicinity of Cuba; wave developments over Florida or the nearby Atlantic coastal waters; wave developments in the Gulf of Mexico west of 85W longitude; inland depressions that deepen upon reaching the coast; secondary cyclonic disturbances in the Hatteras area; intense cyclones moving northeastward, west of the coast; and strong cold fronts with associated squall lines. The seasonal and geographical distributions of these storm types are

investigated. Coastal storms of moderate to severe intensity might be expected at any place along the East Coast of the United States on an average of once every 1.4 years in New York and New Jersey, the area of most frequent occurrence, to once every 4.2 years in Georgia, the area of least frequent occurrence. (Author)

AD-614 203 Div. 2

Army Electronics Labs., Fort Monmouth, N. J.
DOWNWARD ELECTRON FLUX AT 1,000 Km ALTITUDE FROM ELECTRON CONTENT MEASUREMENT AT MID-LATITUDES,
by P. R. Arendt and H. Soicher. 1964, 4p
Unclassified report

Pub. in Nature (Gt. Brit.) v204 n4962 p983-4 Dec 5 1964 (Copies available only to DDC users).

Descriptors: (*Electron density, Ionosphere), (*Diurnal variations, Electron density), Ionospheric disturbances.

Diurnal variation of ionospheric electron content is described for November-December, 1961, at mid-latitudes. The curve is smoothed by normalizing each single observation with respect to the corresponding 10.7 cm radiation which is an indicator of solar activity. The existence of a secondary maximum of ionization content below 1,000 km altitude for a period shortly after midnight is reported. This peak was not removed by normalization and is therefore real. The mechanism responsible for this observed downward drift at high altitudes is not known.

AD-614 217 Div. 2, 20

Enrico Fermi Inst. for Nuclear Studies, Univ. of Chicago, Ill.
SOLAR FLARE HIGH ENERGY ALPHA PARTICLES AND THEIR STORAGE IN INTERPLANETARY SPACE,
by G. Kenneth Yates. 21 Jan 64, 21p
Grant AF AFOSR62 23, Proj. 9774, Task 977402
AFOSR 65-0468
Unclassified report

Pub. in Journal of Geophysical Research v69 n15 p3077-95 Aug 1 1964 (Copies not available to DDC or Clearinghouse customers).
Revision of manuscript submitted 1 Aug 63.

Descriptors: (*Solar flares, Alpha particles), (*Alpha particles, Solar flares), (*Astrophysics, Solar flares), Scintillation counters, Airborne, Balloons, Solar radiation, Alpha particle spectroscopy.

A scintillation counter telescope and a Cerenkov counter flown by high altitude balloon measured the relativistic alpha-particle flux in the late stages of the November 12-13, 1960, solar flare event. The integral solar alpha-particle flux was found to be 55 part/sec sq m ster for kinetic energies greater than 560 Mev/nucleon (R > 2.3 bv). Combined with the results of Biswas, Fichtel, and Guss (31 < E < 112 Mev/nucleon) obtained at the same time, the data are consistent with a differential kinetic energy spectrum variation E to the minus 4th power or a differential magnetic rigidity spectrum variation E to the minus 7th power and do not agree with an exponential magnetic rigidity spectrum. The two Forbush decreases of cosmic ray intensity beginning at 1930 UT, November 12, 1960, and 1030 UT, November 13, 1960, provided a unique opportunity to study the storage and propagation of solar particles in interplanetary space. Steljes, Carmichael, and McCracken have suggested that relativistic solar particles, though trapped to some extent behind the 'front' associated with the first Forbush decrease, 'leaked' out continuously to the galaxy. The time variation of the relativistic solar alpha particles observed here indicates that early in the event the particles initially trapped in the region between the two 'fronts' associated with the Forbush decreases also leaked backward into the region between the second front and the sun. At the time of measurement, the fluxes in the two regions were approximately equal and the net flux across this second front was insignificant. (Author)

AD-614 233 Div. 2, 8
CFSTI Prices: HC$1.00 MF$0.50

Lincoln Lab., Mass. Inst. of Tech., Lexington.
MEASUREMENT OF PROPERTIES OF SPREAD CHANNELS BY THE TWO-FREQUENCY METHOD WITH APPLICATION TO RADAR ASTRONOMY,
by T. Hagfors. 11 Jan 65, 25p
Technical rept. no. TR-372
Contract AF19 628 500
ESD TDR-65-29
Unclassified report

Descriptors: (*Radio astronomy, Electromagnetic wave reflections), (*Radar reflections, Correlation techniques), Frequency, Measurement, Signal-to-noise ratio, Integral transforms, Statistical processes, Radio-frequency spectroscopy.

A particular observation scheme based on the two-frequency correlation function approach for the measurement of time-varying spread channels having time-stationary Gaussian statistical properties is analyzed. It is shown that the scheme works well for underspread as well as overspread channels. The method also appears to be useful in cases where there is correlation between the signals arriving with different delays. Expressions are derived for the variances of the determined correlation and target-scattering functions derived by double Fourier transformation of the observed correlation function. (Author)

AD-614 255 Div. 2
CFSTI Prices: HC$3.00 MF$0.50

Naval Postgraduate School, Monterey, Calif.
A COMPUTER PROGRAM FOR FORECASTING THE WIND DRIFT OF SEA ICE.
Master's thesis,
by William C. Knodle. 1964, 52p
Unclassified report

Available copy will not permit fully reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Programming (Computers), Oceanology), (*Ice, Seas), (*Oceanology, Seas), Wind, Drift, Ice islands, Mathematical prediction, Marine meteorology, Data processing systems.

The theory and equations for forecasting the wind drift of sea ice, as previously developed by several researchers, are being used in the forecasting of that component of sea-ice drift. The existing equations are modified and programmed for use with a computer to produce a forecast of wind drift, thus permitting rapidly made forecasts over large areas. Applicability and limitations, ways of handling other factors, i.e. permanent currents and melting and freezing, and methods for general improvement of the programs are discussed. The programs developed are useful as research tools and as applied to forecasting. (Author)

AD-614 273 Div. 2
CFSTI Prices: HC$2.00 MF$0.50

Hawaii Inst. of Geophysics, Honolulu.
A PROGRAM FOR ROUTINE LOCATION OF T-PHASE SOURCES IN THE PACIFIC.
Technical summary rept.,
by Rockne H. Johnson. March 65, 28p HIG-65-5
Contract Nonr374801, ARPA Order 218 62
Unclassified report

Descriptors: (*Seismology, Pacific Ocean), (*Marine geophysics, Seismology), Earthquakes, Seismic waves, Position finding, Correlation techniques, Programming (Computers), Hydrophones, Guided missile ranges.

Data for this program is supplied principally by the Pacific Missile Range hydrophone network. Hydrophone records are forwarded weekly for reading at Honolulu. In correlating arrivals records from all stations are viewed together. Correlation is established by similarity in shape and level and by locations determined roughly from arrival time differences. Arrival times and power levels are read for processing by an IBM 7040 computer. The solution for location and origin time is the least-squares fit to all hydrophone arrivals which are weighted according to their distribution in azimuth and their distance from the T-phase source. The iterative solution proceeds on the assumption of zero parallax and flat earth in the vicinity of the source. Velocity is derived from shot calibrations and from averaging across a contour map of local velocity. For the computer program this is expressed as a power series in latitude and longitude for each station and for each quadrant of the Pacific. A T-phase strength is computed from readings of peak power level. This strength is computed for a distance of thirty degrees from the source. The lower half and the upper quarter of all hydrophone readings are arbitrarily rejected from computation of strength as being influenced by topographic shadowing or containing mistakes. Events which can be correlated at four or more hydrophones occur at an average rate of about one per hour. (Author)

AD-614 286 Div. 2, 8
CFSTI Prices: HC$3.00 MF$0.75

Braddock, Dunn, and McDonald, Inc., El Paso, Tex.
INVESTIGATION OF THE STATISTICS OF BREAKDOWN USING NANOSECOND PULSE TECHNIQUES.
Final rept.,
by D. F. McDonald, C. J. Benning, and S. J. Brient.
Mar 65, 62p
Contract AF30 602 2781, Proj. 4506, Task 450603
RADC TR-64-584
Unclassified report

Descriptors: (*Electric discharges, Statistical analysis), Radar pulses, Ionospheric propagation, Microwaves, Sparks, Static electricity, Atmospheric electricity, Pulse generators, Electrodes, Voltage, Cosmic ray bursts, Atmospherics, Atmosphere models, Gas ionization, Time-lag theory, Probability.

The experimental equipment, experimental procedures, and test results of a laboratory study of the statistics of discharge initiation in highly over-volted planar spark gaps is presented. The theory of operation of a sub-nanosecond rise-time multikilovolt pulse generator developed for the study is described. Test data on the electron emission of different electrode materials as a function of gap field strength and electrode conditioning is presented. In addition, a simplified model of the statistics of free-space breakdown in a transmitted microwave beam is developed. (Author)

AD-614 295 Div. 2, 25

Aerospace Research Center, General Precision, Inc., Little Falls, N. J.
SOME PERIODIC SOLUTIONS OF A FOUR-BODY PROBLEM,
by Jane Cronin, Paul B. Richards, and Lawrence H. Russell. 21 Aug 64, 7p
Contract AF49 638 1325, Proj. 9749, Task 9749 01
AFOSR 65-0617
Unclassified report

Pub. in Icarus v3 n5/6 p423-8 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*N-body problem, Celestial mechanics), (*Celestial mechanics, N-body problem), Perturbation theory, Sun, Earth, Moon, Motion.

A four-body problem which is a model for the motion of a particle or vehicle in the Sun-Earth-Moon system is obtained by rotating the barycenter B of the two massive bodies in a restricted three-body configuration about a third massive body. It is shown that this problem can be regarded as a perturbation of the restricted three-body problem where the perturbation parameter is the mass of the third body divided by the cubed distance from the third body to B. It is proved that under certain conditions, especially with a restriction on the magnitude of the perturbation parameter, the particle of negligible mass has a periodic motion near each of the libration points of the restricted three-body problem; a method for estimating the restriction on the magnitude of the perturbation parameter is described. (Author)

AD-614 303 Div. 2

Geological Survey, Denver, Colo.
THE BASALT-ECLOGITE TRANSFORMATION AND CRUSTAL STRUCTURE IN THE WESTERN UNITED STATES.
Technical Letter Crustal Studies,
by L. C. Pakiser. 23 Apr 65, 10p
Technical letter no. TL-33
ARPA Order 193 64
Unclassified report

Pub. in Geological Survey Research 1965, U. S. Geological Survey Professional Paper 525-B pB1-8 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Metamorphic rock, Phase studies), (*Basalt, Phase studies), (*Petrology, Metamorphic rock), Rock (Geology), Transformations, Lithosphere, Geochemistry, Geophysics, Earth models.

Comparison of geothermal gradients, crustal structure, and pressure-temperature relations for the basalt-eclogite transformation leads to the conclusion that the transformation zone may occur mainly within the crust in much of the Eastern United States and entirely within the mantle in much of the Western United States. The primitive crust that evolved from the mantle may have been silicic, later to have been made progressively more mafic. (Author)

AD-614 310 Div. 2

Lincoln Lab., Mass. Inst. of Tech., Lexington.
CAUSE OF THE MID-LATITUDE EVENING INCREASE IN f0F2.
Revised ed.,
by J. V. Evans. 17 Dec 64, 11p Rept. no. JA-2479
Contract AF19 628 500
Unclassified report

Pub. in Journal of Geophysical Research v70 n5 p1176-85 Mar 1 1965 (Copies not available to DDC or Clearinghouse customers)
Revision of manuscript submitted 16 Nov 64.

Descriptors: (*Atmospheric sounding, Electron density), (*Ionosphere, Diurnal variations), Twilight, Electrons, Temperature, Radar scanning, Radar echo areas, North America, Geophysics, Sunspots.

The behavior of the electron density and the electron temperature in the F sub 2 region above Millstone Hill radar observatory (42.6 degrees N, 71.5 degrees W) was explored throughout 1963 by means of radar backscatter experiments. In this paper results are presented for April, July, and November 1963. It is shown that the evening increase in f sub 0 F sub 2, observable at mid-latitude stations in summer, is caused by downward diffusion of ionization from above h sub max F sub 2. This motion appears to be induced by the large fall in the electron temperature that occurs at sunset. On the basis of this explanation it is possible to show why the evening increase is absent in winter and is less pronounced at sunspot maximum, and also to account for why the effect is particularly pronounced for North American stations. (Author)

AD-614 323 Div. 2, 20

California Inst. of Tech., Pasadena.
NEUTRINO-SPECTROSCOPY OF THE SOLAR INTERIOR,
by J. N. Bahcall. 20 Nov 64, 2p
Contract Nonr22047, NGR05 002 028
Unclassified report

Pub. in Physics Letters v13 n4 p332-3 Dec 15 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Neutrinos, Sun), (*Sun, Spectroscopy), Astrophysics, Nuclear reactions, Nuclear spectroscopy.

AD-614 327 Div. 2

Washington Univ., Seattle.
VARVED MARINE SEDIMENTS IN A STAGNANT FJORD,
by M. Grant Gross, Sevket M. Gucluer, Joe S. Creager, and William A. Dawson. 7 Jun 63, 2p
Technical rept. no. TR-108
Grant NSF G21326; Contract Nonr47710, Proj. NR083 012
Unclassified report

Pub. in Science v141 n3584 p918-9 Sep 6 1963 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Marine geology, British Columbia), (*Oceanology, Sedimentation), Geochemistry, Aquatic animals, Well logging, Geologic age determination, X-ray diffraction analysis.

Varved sediments, containing planktonic marine diatoms, occur in Saanich Inlet, British Columbia. An olive-gray lamina, rich in opal, apparently forms during the bloom of Skeletonema costatum in the spring or summer, after which an olive-black lamina is deposited. (Author)

AD-614 330 Div. 2, 9, 25

Chicago Univ., Ill.
NON-RADIAL OSCILLATIONS OF GASEOUS MASSES. Revised ed.,
by S. Chandrasekhar and Norman R. Lebovitz.
19 Oct 64, 13p
Contract Nonr212124
Unclassified report

Pub. in Astrophysical Journal v140 n4 p1517-28 Nov 15 1964 (Copies not available to DDC or Clearinghouse customers).
Revision of manuscript submitted 22 Jun 64.

Descriptors: (*Gases, Oscillation), (*Spheres, Gases), Stability, Equations of state, Special functions (Mathematical), Calculus of variations, Potential theory.

In this paper the fundamental frequencies of non-radial oscillations of polytropic gas spheres, belonging to spherical harmonics of orders l = 1 and 2, are evaluated, in a 'second approximation,' by a variational method. Also, the value of the ratio of the specific heats is determined for which an accidental degeneracy occurs between the fundamental modes of radial oscillation and non-radial oscillation belonging to l = 2; it is found that this value of the specific heats varies from 1.6 for a homogeneous compressible sphere to 1.5719 for a polytrope of index n = 3. (Author)

AD-614 331 Div. 2

University of Southern California, Los Angeles.
A CORE ALIGNER DESIGNED TO RECOVER ORIENTED RECENT MARINE CORES,
by Murray Felsher. 1963, 4p
Contract Nonr22817
Unclassified report

Pub. in Limnology and Oceanography v9 n4 p603-5 Oct 1964.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Well logging, Instrumentation), (*Ocean bottom sampling, Well logging), Oceanographic equipment, Drilling machines, Positioning devices (Machinery), Design.

The apparatus provides a tool to determine the orientation of a corer as it penetrates the sea floor. A series of sea tests was successful.

AD-614 335 Div. 2

California Univ., Berkeley.
A STUDY OF THE AFTERSHOCKS AND FOCAL MECHANISM OF THE SALINAS-WATSONVILLE EARTHQUAKES OF AUGUST 31 AND SEPTEMBER 14, 1963,
by Agustin Udias. 13 Oct 64, 22p
Contract AF49 638 904
Unclassified report

Pub. in Bulletin of the Seismological Society of America v55 n1 p85-106 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Earthquakes, Seismology), Shock (Mechanics), Faults (Geology), Sources, Seismological stations, California.

The earthquake sequences connected with the earthquakes of August 31 and September 14, 1963 in the Salinas-Watsonville region of California are studied with reference to the background seismic activity. A very favorable distribution of permanent and mobile stations in this area permits the analysis to include earthquakes of small magnitudes. The mechanism of the larger aftershocks of both sequences is found to be similar to the mechanism of the main shock of September 14, 1963. The orientation of the principal axes of stress derived from the focal mechanism of the September 14 earthquake, is related to the strike of the San Andreas fault. (Author)

AD-614 352 Div. 2

California Univ., Berkeley.
CRUSTAL STRUCTURE IN CENTRAL CALIFORNIA IN RELATION TO THE SIERRA NEVADA,
by Takeshi Mikumo. 13 Oct 64, 19p
Contract AF49 638 904
Unclassified report

Pub. in Seismological Society of America. Bulletin v55 n1 p65-83 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Structural geology, California), Seismology, Geophysical prospecting, Lithosphere, Mountains, Models (Simulation), Earthquakes, Underground explosions, Nevada, Utah.

Crustal structure in central California (between the latitudes of 36 degrees and 41 degrees N) including the Sierra Nevada was studied by travel times of P sub n waves from Nevada explosions and earthquakes, dispersion of surface waves, and correlation between computed and observed gravity anomalies. Simple two-dimensional models are presented for the structure, parameters of which are determined by least-squares from P sub n observations. Theoretical gravity distributions expected from the crustal models are computed by a two-dimensional technique and compared with Bouguer anomalies. In the preferred model, the overall crustal depths to the Moho-discontinuity beneath the Pacific coast region, the Central Valley and the Sierra Nevada are found to be about 22, 26 and 43 km, respectively, indicating a steep crustal thickening under the high mountain region. The dispersion of group velocities of Rayleigh and Love waves passing across the region was investigated from Nevada and Utah earthquakes, Love waves from the Utah earthquake give evidence in support of the derived structure. (Author)

AD-614 354 Div. 2

Lunar and Planetary Lab., Univ. of Arizona, Tucson.
INFRARED PHOTOMETRY OF M-DWARF STARS,
by Harold L. Johnson. 8 Sep 64, 8p
Unclassified report

Pub. in Astrophysical Journal v141 n1 p170-6 Jan 1 1965 (Copies not available to DDD or Clearinghouse customers).
Research supported by the Office of Naval Research and National Science Foundation, Washington, D. C.

Descriptors: (*Stars, Infrared spectroscopy), (*Infrared spectroscopy, Stars), (*Astrophysics, Stars), Photometers, Astronomical data, Tables, Graphics.

The results of eight-color photometry, over the range of wavelength from 0.35 to 3.5 micron, are given here for 43 K- and M-dwarf stars. The range of spectral types is from K0 to M8. The mean colors, bolometric corrections, effective temperatures, and radii have been derived for M-type dwarfs; a comparison of the derived data with Limber's theoretical work indicates good agreement for the effective temperatures, but the observed luminosities are larger than the computed ones by about 0.5 mag. One star, Barnard's Star, is a subdwarf in the bolometric-magnitude-effective-temperature diagram. (Author)

AD-614 361 Div. 2

Lunar and Planetary Lab., Univ. of Arizona, Tucson.
MULTICOLOR PHOTOMETRY OF CARBON STARS,
by Harold L. Johnson and Eugenio E. Mendoza, V.
24 Aug 64, 9p Unclassified report

Pub. in Astrophysical Journal v141 n1 p161-9 Jan 1 1965(Copies not available to DDC or Clearinghouse customers)
Prepared in cooperation with National University of Mexico.

Descriptors: (*Stars, Optical analysis), (*Variable stars, Optical analysis), Carbon, Astrophysics, Temperature, Photometers, Bolometers, Colors.

Multicolor photometric observations, were made over the range of wavelength from 0.35 microns in the ultraviolet to nearly 10 microns in the infrared, were made on thirty-nine carbon stars and six late-type long period variable stars. The bolometric corrections and effective temperatures of these stars were computed and used to construct the absolute bolometric-magnitude---effective-temperature diagram for carbon stars. The effective temperatures of the carbon stars range from 5500 degrees K downward to 2270K. The bolometric corrections range from almost zero to nearly 5 mag. The apparent angular diameters of some of the carbon stars are as large as 0.01 inches---large enough to be measurable by a Michelson interferometer with a 50-foot beam. (Author)

AD-614 381 Div. 2

Laboratory for Nuclear Science, Mass. Inst. of Tech., Cambridge.
ISOTROPY OF COSMIC RADIATION,
by J. Linsley, L. Scarsi, P. J. Eccles, and B. B. Rossi. 26 Feb 62, 2p
Grant NSF G19728
Unclassified report

Pub. in Physical Review Letters v8 n7 p286-7 Apr 1 1962.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cosmic rays, Atmospheric refraction), Isotropism, Intensity, Statistical data, Anisotropy, Angle of arrival.

AD-614 395 Div. 2, 24
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
EXPERIMENTS IN TELEVISION PHOTOGRAPHY OF THE MOON IN THE 0.8-1.1 AND 0.8-2.3 MICRON RANGE,
by N. F. Kuprevich. 30 Mar 65, 18p
FTD-TT-65-90
TT 65-62071
Unclassified report

Unedited rough draft trans. of Glavnay.. Astronomicheskaya Observatoriya, Pulkovo. Izvestiya (USSR) v23 n2 p110-4 1963.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Moon, Television communication systems), (*Television communication systems, Infrared photography), (*Infrared photography, Moon), Lunar probes, Surfaces, Photographs, Photographic images, Television transmitters, Optical images, Photographic contrast, Infrared radiation, Luminescence, Photocathodes, USSR.

The article describes the results of observing the surface of the moon in the spectral range of 0.8-2.3 microns by means of a television system. Comparison is made between infrared photographs and those taken earlier by

other authors in the visible range. It was discovered that with an increase in wavelength into the infrared region of the spectrum the photos exhibited an increase in contrast and revealed lunar surface details not detected on ordinary photographs. It is proposed that the increase in contrast and the appearance of new details in the lunar surface image may be explained by a decrease in luminescent radiation in the infrared rays. (Author)

AD-614 399 Div. 2, 24
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
CALIBRATION OF SURVEY CAMERAS ON THE BASIS OF MODEL DEFORMATIONS,
by H. Schoeler. 20 Apr 65, 14p FTD-TT-65-246
TT 65-62075

Unclassified report

Unedited rough draft trans. of mono. (report) from Veb Carl Zeiss, Jena, p1-7 nd.

Descriptors: (*Topographic cameras, Calibration), Surveying, Cameras, Photogrammetry, Distortion.

AD-614 401 Div. 2
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
COMMENTS ON THE EFFECT OF A DEFORMED, PLANE PARALLEL GLASS PLATE IN THE IMAGE PLANE OF AN OBJECTIVE ON ITS DISTORTION,
by Wolf Dannberg and Gerhard Wuertz. 26 Apr 65, 13p FTD-TT-65-249
TT 65-62057

Unclassified report

Unedited rough draft of mono. (report) from Veb Carl Zeiss, Jena 6p nd.
Available copy will not permit full legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for pbublic sale.

Descriptors: (*Photographic images, Deformation), (*Photogrammetry, Photographic images), Glass, Optics, Integration, Differential equations, East Germany.

Methods for computing optical compensation plates in the case of oblique image observation. Advantages and drawbacks of the methods under discussion are explained by way of a practical example. (Author)

AD-614 409 Div. 2
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
THE WORLD MAGNETIC SURVEY AND THE EARTH'S INTERIOR,
by E. H. Vestine. Apr 65, 14p Rept. no. P-3104

Unclassified report

Prepared for inclusion in Proceedings of the International Symposium on the Earth's Interior, held at the University of Pittsburgh, 16-20 Nov 64
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Terrestrial magnetism, Surveying), (*Geophysics, Terrestrial magnetism), Earth, Fluid flow, Magnetohydrodynamics, Measurement, Scientific satellites, Scientific organizations, Research program administration.

The present World Magnetic Survey is described and discussed in relation to defining the earth's main field and secular change. Some effects dependent on geomagnetic noise levels affecting the survey are indicated. Difficulties incident to the extrapolation of faulty surface-field data to the surface of the core are noted. The extrapolated results of previous surveys are used to indicate the possible principal descriptive features of surface fluid motions that are derived for the outer core. (Author)

AD-614 411 Div. 2
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
THE SCIENTIFIC STUDY OF METEORS IN THE 19TH CENTURY,
by Mary F. Romig. Apr 65, 20p Rept. no. P-3108

Unclassified report

Descriptors: (*Meteors, Scientific research), (*Meteorites, Scientific research), History, Astronomy, Theory.

Evidence is given that most of the hypotheses stated in 1794 by Chladni (E.F.F. Chladni, 'The Origin of Iron Masses, that one found by Pallos and others analogous to it, and therewith on Some Related Natural Phenomena, published in Riga, 63 pages) were proved true by the time Schiaparelli published his monograph in 1871 ('Outline of an Astronomical Theory of Shooting Stars', translated from Italian by G. von Boguslawski, published in Stettin, 268 pages). The unitary nature of meteors, fireballs, and meteorites had not been scientifically proven, however. When the Mazapil meteorite fell during a meteor shower on Nov. 27, 1885, the objection to the belief of the same origin for the meteor, fireball, and meteorite was removed so that further research in the 19th century could proceed on the basis that all three phenomena were closely related (J. Norman Lockyer. 'The Meteorite Hypothesis.' London, MacMillan, 1890, 560 pages).

AD-614 427 Div. 2, 30, 31

Scripps Institution of Oceanography, Univ. of California, La Jolla.
DEVELOPMENT AND TESTING OF TAUT-NYLON MOORED INSTRUMENT STATIONS (WITH DETAILS OF DESIGN AND CONSTRUCTION),
by John D. Isaacs, George B. Schick, Meredith H. Sessions, and Richard A. Schwartzlose. 15 Apr 65, 86p Ref-65-5

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Oceanographic equipment, Mooring), (*Monitors, Oceanographic equipment), (*Nylon, Cordage), Catamarans, Buoys, Instrumentation, Measurement, Ocean currents.

One of the persistent problems of oceanography is to ascertain the nature and cause of large-scale shifts in the surface water masses of the oceans. The existence of such changes are readily apparent from vessel measurements. However, the nature of the motions involved cannot be documented by any feasible ship survey. It probably can best be documented by an array of continuous recording instrument stations. For this and other purposes deep-moored instrument stations have been designed that record meteorological data and oceanographic data in the upper few hundred meters. Twenty installations of

evolving designs of the taut-nylon mooring have been tested over a period of 3-1/2 years. The approach has resulted in an increasing reliability and life of the installations and recent designs have a useful life of at least six months when moored in the deep open sea and much longer in deep sheltered areas. Developments and results of tests are discussed. Complete construction drawings with notes on construction, installation, and servicing are included. (Author)

AD-614 428 Div. 2
CFSTI Prices: HC$8.05 MF$2.50

Aerospace Research Labs., Office of Aerospace Research, Wright-Patterson AFB, Ohio.
TABLE OF HARTREE-FOCK SELF CONSISTENT FIELD WAVE FUNCTIONS WITH EXCHANGE.
Rept. for Nov 63-Oct 64,
by T. K. Krueger, W. L. McDavid, and S. J. Czyzak.
Jan 65, 502p Rept. no. ARL 65-10
Proj. 7112, Task 711202
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Atomic spectroscopy, Astrophysics), (*Quantum mechanics, Astrophysics), (*Tables, Astrophysics), Electron transitions, Programming languages, Atomic energy levels.

A table is presented of the Hartree-Fock wave functions for various atoms and ions mainly of astrophysical interest having atomic numbers up to 56. Also included in the table are the one-electron energy parameters and the relativistic and spin-orbit energy corrections. (Author)

AD-614 437 Div. 2

California Univ., Los Angeles.
MARINE GEOLOGY AND OCEANOGRAPHY OF FLORIDA BAY, APALACHICOLA BAY AND VICINITY, FLORIDA.
Final data rept. for Jan 61-Dec 62,
comp. by Donn S. Gorsline. Mar 65, 115p
Rept. no. USC-GEOL-65-1
Contract Nonr22826, Proj. NR388 072
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Marine geology, Florida), (*Oceanology, Florida Strait), (*Florida Strait, Oceanology), Mexico Gulf, Beaches, Hydrographic surveying, Oceanographic data, Tables, Maps.

This data report is a summation of field and laboratory work done from January, 1960 through June, 1964 on various coastal and estuarine environments located along the northern Gulf Coast of Florida and in the Florida Keys.

AD-614 441 Div. 2
CFSTI Prices: HC$6.00 MF$1.25

Denver Univ., Colo. Dept. of Geography.
TRINCHERAS AND PHYSICAL ENVIRONMENT ALONG THE RIO GAVILAN, CHIHUAHUA, MEXICO.
Final rept., Publications in Geography,
by Laurance C. Herold. Mar 65, 228p
Pub. no. 65-1, DRI-2214
Contract DA19 129AMC277N, Proj. 1K025001A129
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Geography, Mexico), (*Mexico, Geography), Geological survey, Soils, Climatology, Plants (Botany), Irrigation systems, Dams, Maps.

This study deals with aboriginal check dams, called trincheras, and the physical environment in which they are found in the eastern portion of the Sierra Madre Occidental of Chihuahua, Mexico. A temporary weather station gathered data on air temperature, soil temperature, net radiation, precipitation, relative humidity, etc., over a 56-day period, 18 June--12 August, 1964. These data are discussed and comparisons of temperatures and precipitation are made with Nuevo Casas Grandes, a permanent weather station 43 air miles to the northeast. Trincheras are described by dimensions, types, construction, and functions. The relationships between trincheras and selected terrain features are mapped and discussed. Geology, relief, soils, and vegetations of the area are included. (Author)

AD-614 454 Div. 2

Washington Univ., Seattle.
SEDIMENTS OF WILLAPA SUBMARINE CANYON,
by Chester F. Royse, Jr. Sep 64, 70p
Technical rept. no. TR-111, Ref-M64-60
Contracts Nonr47710, Nonr47737, Projs. NR083 012, RR004 03 01
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Oceanology, Pacific Ocean), Seacoast, Washington, Ocean bottom topography, Sedimentation, Geochemistry, Oceanographic data, Maps, Tables.

A study of Willapa Submarine Canyon, located off the Washington coast, was undertaken in an attempt to define the type, distribution, and rate of deposition of sediment within the canyon. Well sorted sands are common on the continental shelf near the canyon head and green pelagic muds predominate within the canyon. The muds are thinly bedded and cores from the thalweg contain sand layers. Organic- and carbonate-carbon contents of sediments range between 0.2-2.9 and 0.05-1.5 per cent respectively. The clay-sized fraction of the average sediment consists of approximately 20 per cent Fe-chlorite, 30 per cent kaolinite, and 50 per cent illite with minor amounts of montmorillonoids and mixed-layer clays. Analyses of the heavy-mineral and clay-mineral suites show that the Columbia River is the most probable source of sand and mud in the canyon. Rock dredged from the canyon walls contains fossils which suggest Willapa Canyon has formed since early-Pliocene time.

AD-614 455 Div. 2
CFSTI Prices: HC$5.00 MF$1.00

Washington Univ., Seattle.
PHYSICAL AND CHEMICAL DATA FOR PUGET SOUND AND APPROACHES, SEPTEMBER 1956-DECEMBER 1957,
by Eugene E. Collias and Clifford A. Barnes.
Oct 64, 171p Technical rept. no. TR-110, Ref-M64-27
Contracts Nonr47710, Nonr47737, Projs. NR083 012, RR004 03 01
Unclassified report

Descriptors: (*Oceanology, Puget Sound), (*Puget Sound, Oceanology), Oceanographic data, Tables, Maps.

This report is a tabulation of physical and chemical

oceanographic observations made at various locations in puget sound and its approaches by the University of Washington Department of Oceanography, using the research vessel Brown Bear. Charts show the position of stations sampled. Values for temperature, salinity, dissolved oxygen and dissolved inorganic phosphate, as determined by use of accepted oceanographic procedures, are given at selected depths from the surface to bottom. (Author)

AD-614 456 Div. 2

Washington Univ., Seattle.
PHYSICAL, CHEMICAL AND BIOLOGICAL DATA FROM THE NORTHEAST PACIFIC OCEAN: COLUMBIA RIVER EFFLUENT AREA, JULY-AUGUST 1961,
by C. M. Love. Oct 64, 266p
Technical rept. no. TR-112, Ref-M64-68
Contracts Nonr47710, Nonr47737, Proj. NR083 012
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Oceanology, Pacific Ocean), (*Pacific Ocean, Oceanology), Seacoast, Washington, Oregon, Oceanographic data, Tables, Disposal, Radioactive waste.

The objectives of this study are to determine the gross features of the movement and dispersion of Columbia River effluent water in the open sea off the mouth of the river and along the adjacent coast, and ultimately to ascertain the probable fate of any radioactive material that might be associated with the effluent or with river-borne materials.

AD-614 475 Div. 2
CFSTI Prices: HC$3.00 MF$0.75

Sperry Rand Research Center, Sudbury, Mass.
SPACE-TIME VARIABILITY OF THE THERMAL STRUCTURE OF THE UPPER LAYERS OF THE OCEAN.
Master's thesis; Research rept.,
by Jerome B. Carr. Mar 65, 98p
Rept. no. SRRC-RR-64-70
Unclassified report

Descriptors: (*Oceans, Thermal properties), Oceanology, Thermodynamics, Atlantic Ocean, Temperature, Mapping, Oceanographic data, Statistical analysis.

A parameter is developed for measuring changes in the structure of the mixed layer. Time series analysis shows stable thermal conditions existing for several days, followed by very rapid decay of thermal structure. These periods of decay or 'nonrepresentativeness' are examined and found to be due to mixing regions between horizontally advecting discrete water masses and independent of 40 meteorological and oceanographic parameters. The spacial study indicates that data density is a critical factor and that present methods of contouring mixed layer depths needs serious revision. Accordingly, a new technique is developed for mapping mixed layer depths. (Author)

AD-614 523 Div. 2

Harvard Coll., Cambridge, Mass. Observatory.
COMPARISON BETWEEN MODEL ATMOSPHERES AND SPECTRA FROM EARLY-TYPE STARS,
by E. H. Avrett and S. E. Strom. 22 Aug 64, 17p
Unclassified report

Pub. in Annales d'Astrophysique v27 n6 p781-96 Nov-Dec 1964 (Copies available only to DDC users).

Rept. presented at the Symposium on Astronomical Observations made by Space Vehicles (23rd), Liege, Belgium, 17-20 Aug 64.

Descriptors: (*Atmosphere models, Spectra (Visible and Ultraviolet)), (*Ultraviolet spectroscopy, Atmosphere models), Stars, Astrophysics, Continuum mechanics.

To assist in the interpretation of ultraviolet continuum observations, observational features are presented of a grid of non-grey model atmospheres in strict radiative equilibrium which have effective temperatures in the range 10000K to 20000K and surface gravities 1000 and 10000. For three models, the blended wings of the higher Balmer and Lyman hydrogen lines are added and include in an approximate way further effects of line blanketing in the ultraviolet. Finally, a preliminary calculation is presented of the effect of departures from L.T.E. on the continuous flux. To examine the validity of the models, the predicted continuous flux and predicted line profiles are compared with the corresponding observed quantities for Vega and Sirius. The question of discrepancies between theory and observations in the ultraviolet is considered from the viewpoint of these new calculations, and find generally good agreement with recent observations made by T. Stecher. (Author)

AD-614 536 Div. 2

Sydney Univ. (Australia).
THE STELLAR INTERFEROMETER AT NARRABRI.
Reprint,
by R. Hanbury Brown. 1964, 4p
Grant AF AFOSR302 63, Proj. 9774, Task 977401
AFOSR 65-0450
Unclassified report

Presented at the International Commission for Optics Conference on Interference and Coherence, Sydney, Australia, 24-27 Aug 64.
(Copies available only to DDC users.)

Descriptors: (*Interferometers, Astronomical observatories), (*Astronomy, Interferometers), Electron tubes, Photomultipliers, Electronic recording systems, Measuring devices (Electrical and Electronics), Stars, Optical scanning.

The interferometer at Narrabri makes use of an intensity interferometer to achieve a max resolution of approx 0.0005 sec of arc. It is designed to measure the apparent angular diam of all stars brighter than magnitude +2.5 and with spectral type earlier than F. O. The instrument consists of 2 large mirrors 22 ft in diam which move on a circular track 618 ft in diam. The mirrors are controlled by a computer to follow the chosen star in azimuth and elevation. At the focus of the 2 mirrors there are photomultipliers which view the star through narrow-band interference filters. The output currents of the 2 photomultipliers are carried by coaxial cables to an electronic correlator which amplifies the fluctuations in the 2 currents in the frequency range 10-120 mcps and multiplies them together to measure their correlation. In operation the correlation is measured as a function of the separation between the 2 mirrors. A single observation at 1 spacing requires approx 3 hr for a star of magnitude +1.0. (Author)

AD-614 546 Div. 2, 25

Narragansett Marine Lab., Univ. of Rhode Island, Kingston.
SOME CHARACTERISTICS OF 25-cps SHALLOW-WATER AMBIENT NOISE.
Initial rept.,
by Jack Willis and Frank T. Dietz. 21 Sep 64, 10p
Ref-65-1, TR-1

Contract Nonr39613, Projs. NR186 300, RF001 03 06
Unclassified report

Pub. in Journal of Acoustical Society of America v37 n1 p125-30 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Oceanology, Narragansett Bay), (*Tides, Noise), Audiofrequency, Tidewater, Ocean currents, Signal-to-noise ratio, Transducers, Velocity, Electronic recording systems, Measurement.

Ambient-noise measurements in a 1-octave band centered at 25 cps were made at a shallow-water location in Narragansett Bay, Rhode Island, using a velocity-sensitive transducer. Measurements over one month showed that the predominant factor influencing the ambient-noise levels was the tidal current. The noise levels reflected the effects of both the lunar and solar tides. (Author)

3. Chemical Warfare Equipment and Materials

AD-614 392 Div. 3
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
CHEMICAL WEAPONS,
by I. Aleksandrov. 30 Mar 65, 10p
FTD-TT-65-68
TT 65-62068
Unclassified report

Unedited rough draft trans. of Voennye Znaniya (USSR) v40 n6 p33-4 1964.

Descriptors: (*Chemical warfare agents, United States), Chemical warfare, Toxicity, Poisonous gases, Tear gas, Vomiting agents, Sarin, Tabun, Phosgene, Poisoning, Respiration, Air pollution, Water supplies, Food, Contamination, Psychochemical agents, Chemical bombs, Underground structures, USSR.

AD-614 404 Div. 3
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
BIOLOGICAL WEAPONS,
by A. Ivanov. 16 Apr 65, 7p FTD-TT-65-389
TT 65-62061
Unclassified report

Biologicheskoe Oruzhie, unedited rough draft trans. of Tekhnika i Vooruzhenie (USSR) n9 p82-4 1964.

Descriptors: (*Biological warfare agents, United States), Biological warfare, Chemical warfare agents, Bacteria, Fungi, Microorganisms, Diseases, Herbicides, Bacterial aerosols, USSR.

4. Chemistry

AD-613 920 Div. 4

Wisconsin Univ., Madison.
LEWIS ACID ADDUCTS OF GROUP IV-A AZIDES,
by John S. Thayer and Robert West.
29 Jun 64, 2p
Grant AF AFOSR62 244
AFOSR 65-0533

Unclassified report

Pub. in Inorganic Chemistry (U. S.) v4 n1 p114-5 Jan 1965 (Copies not available to DDC or Clearinghouse customers).
Presented in part before the Inorganic Division of the American Chemical Society at the 147th Annual National Meeting, Philadelphia, Pa., April 9, 1964.

Descriptors: (*Azides, Complex compounds), (*Complex compounds, Azides), Group IV elements, Silicon compounds, Germanium compounds, Tin compounds, Boron compounds, Antimony compounds, Chlorides, Borides, Decomposition, Band spectrum, Acids.

The previous isolation of complexes having the formula (C6H5)3MN3.P(C6H5)3 and the lability of (CH3)3SiN3 in the presence of AlCl3 suggested that group IV-A azides might act as Lewis bases. It was found that the Lewis acids SnC14, BBr3, and SbC15 form stable 1:1 adducts with azides of Si, Ge, and Sn. All of the complexes isolated, except for CH3(C6H5)2-SiN3. BBr3, were white solids that decomposed without melting. They dissolve without appreciable dissociation in dichloromethane, chloroform, carbon tetrachloride, and benzene; contact with water, alcohols, or acetone causes immediate decomposition. Azide band positions in the complexes differ markedly from those of the free azides. In addition, all silyl azide complexes show a strong band at about 980/cm. not present in other complexes.

AD-613 921 Div. 4

Utah State Univ., Logan.
PYROLYSIS STUDIES. XII. STERIC INHIBITION OF RESONANCE IN THE VAPOR PHASE,
by Grant Gill Smith and Danny V. White.
16 Jul 64, 6p
Grant AF AFOSR62 268, Proj. 9762, Task 976203
AFOSR 65-0536

Unclassified report

Pub. in Journal of Organic Chemistry (U. S.) v29 p3533-5 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Acetates, Pyrolysis), (*Pyrolysis, Reaction kinetics), (*Stereochemistry, Acetates), Vapors, Resonance, Chemical bonds, Atomic orbitals, Molecular structure, Organic solvents, Elimination reactions, Spectra (Visible and ultraviolet), Nuclear magnetic resonance.

A careful determination of the absolute reaction rate constants for the vapor phase thermal decomposition of 1-(4'-methoxyphenyl)ethyl acetate and its 3'methyl and 3',5'-dimethyl derivatives provides convincing evidence that P1-orbital overlap of the methoxy substituent with the P1-electrons of the ring is markedly reduced by steric hindrance of methyl groups ortho to the methoxy substituent. Therefore, steric inhibition of resonance is a property of the molecule and does not require solvation of the substituents. (Author)

AD-613 922 Div. 4

RIAS, Inc., Baltimore, Md.
THE EFFECT OF SUBSTITUTION ON THE IONIZATION POTENTIALS OF FREE RADICALS AND MOLECULES. VII. THEORETICAL RATIONALIZATION FOR DIFFERING CORRELATIONS FOUND FOR BOND DISSOCIATION ENERGIES WITH IONIZATION POTENTIALS AND ELECTRON AFFINITIES OF ORGANIC OR INORGANIC RADICALS,
by Joyce J. Kaufman. 27 Apr 64, 3p
Contract AF49 638 1220
AFOSR 65-0570

Unclassified report

Pub. in Journal of Physical Chemistry (U. S.) v68 n11 p3155-7 Nov 1964 (Copies not available to DDC or Clearinghouse customers).
See also AD-295 124.

Descriptors: (*Free radicals, Ionization potential), (*Ionization potentials, Free radicals), Chemical bonds, Dissociation, Thermochemistry, Substitution reactions, Electrons, Organic compounds, Inorganic compounds.

The discrepancy previously noted in the relations of bond dissociation energies into organic radicals (linear with ionization potentials) or inorganic radicals (linear with the differences between ionization potential and electron affinity) is explained on both semiempirical and theoretical grounds. In earlier research on the effect of substitution on ionization potentials of free radicals, it was shown possible to place electronegatives, CHI, of organic radicals correctly in the experimentally observed order solely on the basis of their ionization potentials. Since CHI is about (I + E)/2, this dependence of CHI on I alone indicated that E was small relative to I and/or varied comparatively little for a series of organic radicals. On the contrary, E for a series of inorganic radicals where the central atom can be as diverse as N, O, F, Cl, Br, etc., will vary over a much wider range. A theoretical rationalization based on Mulliken's 'magic formula' gives further confirmation to the justification for the differing relationship between dissociation energies and ionization potentials or ionization potentials minus electron affinities for organic and inorganic radicals. (Author)

AD-613 923 Div. 4

Wisconsin Univ., Madison.
SYNTHESIS OF A SILAZAROPHENANTHRENE,
by James M. Gaidis and Robert West. 14 Sep 64, 2p
Grant AF AFOSR62 244
AFOSR 65-0532

Unclassified report

Pub. in American Chemical Society. Journal (U. S.) v86 p5699-700 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Silanes, Synthesis (Chemistry)), (*Polycyclic compounds, Synthesis (Chemistry)), (*N-heterocyclic compounds, Synthesis (Chemistry)), Aromatic compounds, Chemical bonds, Atomic orbitals, Spectra (Visible and ultraviolet), Spectra (Infrared), Molecular structure, Azides, Photochemistry.

The heteroaromatic compound 10,10-dimethyl-9,10-azasiladihydrophenanthrene was obtained by the

photolysis of an organosilyl azide. The aromatic character of the compound is discussed from the standpoint of MO theory, and the ultraviolet and infrared spectra are reported.

AD-613 924 Div. 4

Kansas Univ., Lawrence. Dept. of Chemistry.
CORRELATION OF SOLVENT EFFECTS ON ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF THE NITROBENZENE ANION RADICAL,
by James Q. Chambers, III, Thomas Layloff, and Ralph N. Adams. 14 Dec 63, 4p
Contract AT11 1 686, Grant AF AFOSR62 14,
Proj. 9763 37630
AFOSR 65-0525

Unclassified report

Pub. in Journal of Physical Chemistry (U. S.) v68 n3 p661-2 Mar 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Free radicals, Nitrobenzenes), (*Nitrobenzenes, Nuclear paramagnetic resonance), (*Nuclear paramagnetic resonance, Nitrobenzene), Organic solvents, Formamides, Water, Protons, Band spectrum, Hyperfine structure.

The e.p.r. spectrum of the nitrobenzene anion radical via electrolysis in dimethylformamide (DMF)-water mixtures was obtained using tetraethylammonium perchlorate as supporting electrolyte. The spectra were obtained with slow magnetic field sweeps so that proton coupling constants could be evaluated accurately. The coupling constants for the meta and ortho protons hardly change at all with addition of water, while the N(14) and para proton couplings change markedly with small additions of water and level off at large water concentrations. More important, there exists a 1:1 correlation between the N(14) coupling constant and the doublet splitting of the para hydrogen. This relationship for DMF-H2O mixtures includes all solvent systems studied to date with the exception of Ward's spectrum in tetrahydrofuran. (Extracted)

AD-613 945 Div. 4, 14
CFSTI Prices: HC$2.00 MF$0.50

Food, Machinery, and Chemical Corp., Princeton, N. J.
QM ELASTOMER CONTRACT.
Progress rept. no. 4, 27 Mar-25 Jun 64,
by J. A. Gannon, C. A. Erickson, and E. W. Cook.
15 Jul 64, 36p Rept. no. PCR-397
Contract DA19 129AMC147N, Proj. B132

Unclassified report

See also AD-606 286.

Descriptors: (*Elastomers, Synthesis (Chemistry)), (*Halocarbon plastics, Synthesis (Chemistry)), Vinyl plastics, Polymerization, Halogenated hydrocarbons, Alkenes, Fluorine compounds, Heat-resistant plastics, Copolymerization.

Hydrogen-containing oxetanes have been successfully prepared for the first time by the photolysis of hexafluoroacetone with ethylene and vinylidene fluoride. In both cases polymeric products, in addition to oxetanes, were found. All of the polymeric products isolated to date are of low molecular weight. The reaction offers promise of affording a new route to linear polyethers. A new elastomer system has been discovered involving the condensation of a fluorine-containing diol with a fluorocarbon diene. This product is presently being characterized but its low Tg (-57C) is very encouraging. Attempts to modify the C3F6/ CF2= CH2 system by incorporation of termonomers have not proved successful. Attempts to use the thermal cycloaddition of fluorocarbons as a polymer forming reaction have proved unsuccessful. (Author)

AD-613 989 Div. 4, 9, 22
CFSTI Prices: HC$1.00 MF$0.50

Naval Ordnance Lab., White Oak, Md.
ON EQUATIONS OF STATE IN SHOCK INITIATION PROBLEMS.
Progress rept.,
by Julius W. Enig and Francis J. Petrone.
1 Mar 65, 17p Rept. no. NOLTR-64-182
Task FR59

Unclassified report

Descriptors: (*Equations of state, Explosives initiators), (*Explosives initiators, Shock waves), (*Shock waves, Explosives initiators), Liquids, Explosion bubbles, Explosive materials.

The past use of thermodynamically incompatible equations of state is investigated. In particular, the previous use of the Mie-Gruneisen equation of state in shock initiation problems for liquid explosives is analyzed. More careful analysis shows that theoretical calculations using this equation of state are not in satisfactory agreement with the experimental results. (Author)

AD-614 041 Div. 4, 25
CFSTI Prices: HC$4.00 MF$0.75

Lockheed Missiles and Space Co., Sunnyvale, Calif.
BASIC STUDY OF GAS-SOLID INTERACTIONS: I. INTERACTION OF HYDROGEN WITH PLATINIZED CARBON.
Technical rept.,
by Andrew J. Robell. 2 Mar 64, 115p
Rept. no. 6-74-64-6

Unclassified report

Descriptors: (*Carbon, Chemisorption), (*Chemisorption, Carbon), (*Hydrogen, Adsorption), (*Platinum, Adsorption), Diffusion, Gases, Solids, Scattering, Dissociation, Deuterium, Surfaces, Heat of activation, Oxidation, Methane.

It has been confirmed that the dispersion of platinum on the surface of Spheron-6 carbon increases the adsorption of hydrogen, both in rate and in amount. This excess adsorption, which is too great to be accounted for by the platinum alone, has been measured at 300 to 392 degrees C, at pressures from 30 to 60 cm Hg, and at Pt contents of 0.2 percent and 1.0 percent by weight. The observed dependence of the excess adsorption on these variables and the results of deuterium adsorptions point to a mechanism pictured as follows: Hydrogen adsorbs and dissociates quickly on the Pt. Around the Pt a zone is established which is in equilibrium with the gas phase. This zone acts as a source for surface diffusion of H atoms along the carbon surface. Alternate mechanisms are discussed and rejected. The proposed model is described quantitatively and adequate agreement is obtained with experiment. Within the framework of the model, the activation energy for surface diffusion is 39.2 kcal/g-atom H, and the surface diffusion coefficient at 392C is 5.77 times 10 to the -17th power sq cm/sec. (Author)

AD-614 077 Div. 4, 14
CFSTI Prices: HC$2.00 MF$0.50

Air Force Materials Lab., Air Force Systems Command, Wright-Patterson AFB, Ohio.
STATIONARY STATE CRITERION FOR FREE RADICAL POLYMERIZATION FOR LINEARLY INCREASING REACTION TEMPERATURE.
Rept. for Mar 63-Nov 64,
by Matatiahu Gehatia and John Broehl. Feb 65, 30p
Rept. no. ML TR-64-405
Proj. 7340, Task 734004

Unclassified report

Descriptors: (*Free radicals, Polymerization), (*Polymerization, Reaction kinetics), Differential equations, Transformations (Mathematics), Transcendental functions, Bessel functions, Inequalities, Temperature.

The kinetics of free radical polymerization were treated theoretically under the assumption that the reaction temperature increases at constant rate (T = const). From The Arrhenius relationships for the kinetic rate constants, approximate corresponding functions of time were derived, which transformed the kinetic equations accordingly. A differential equation describing the sum of the concentrations of all free radicals appearing in such a system was solved by approximation, and from the resulting series the conditions for the lower as well as the upper bound of the stationary state assumptions were obtained. (Author)

AD-614 083 Div. 4, 25
CFSTI Prices: HC$1.00 MF$0.50

Institute for the Study of Rate Processes, Univ. of Utah, Salt Lake City.
REACTION KINETICS, THE THEORY OF LIQUIDS, AND OPTICAL ROTATION.
Progress rept. no. 4, 1 Oct 63-31 Mar 64,
by Dennis Caldwell, Gilford A. Chappell, Sheng Hsien Lin, Donald McLaughlin, and Tadashi Watanabe.
31 Mar 64, 7p
Grant DA ARO D31 124G298

Unclassified report

See also AD-428 109.

Descriptors: (*Molecular rotation, Theory), (*Liquids, Thermodynamics), (*Thermal conductivity, Liquids), Electron transitions, Optical phenomena, Reaction kinetics, Dipole moments, Solvents.

Research progress concerning optical rotation, thermodynamics of liquids, and thermal conductivity of liquids is briefly reviewed. A list is included of publications generated under the contract during the reporting period.

AD-614 098 Div. 4
CFSTI Prices: HC$3.00 MF$0.75

TRACOR, Inc., Austin, Tex.
ELECTROCHEMICAL STUDIES IN THE SYNTHESIS OF N-F COMPOUNDS.
Quarterly status rept. no. 8 (Summary) for 1 Jan-31 Dec 64,
by Larry G. Spears, Larry D. Fiel, Wallace E. Harrell, Jr., and Margaret H. Northrup. 7 Apr 65, 80p
TRACOR-65-172-U
Contract Nonr405400, Proj. RR001 06 02, ARPA Order 399

Unclassified report

See also AD-609 959.

Descriptors: (*Ammonium compounds, Fluorination), (*Hydrazine derivatives, Fluorination), (*Fluorination, Electrochemistry), (*Nitrogen compounds, Fluorides), (*Electrodes, Corrosion), Oxidizers, Synthesis (Chemistry), Hydrogen compounds, Fluorides, Laboratory equipment, Anodes (Electrolytic cells), Corrosion-resistant alloys, Nickel alloys, Copper alloys, Mercury compounds.

The goal of the work is to determine the mechanism by which electrochemical fluorination of ammonium and hydrazinium salts occur in anhydrous hydrogen fluoride (AHF). A major portion of the work to date was done to (1) develop a suitable reference electrode, (2) construct an HF handling system for preparing and maintaining AHF at low electrical conductivities, and (3) select a suitable working electrode. The Hg/Hg2F2 electrode satisfies the requirements for a reference electrode, and Monel (alloy 400) satisfies the requirements for a working electrode. Monel is now being used as an anode and Hg/Hg2F2 as a reference electrode in studying the electrolysis of NH4F in AHF. (Author)

AD-614 183 Div. 4

Missouri School of Mines and Metallurgy, Rolla.
ELECTROCHEMICAL BEHAVIOR OF TiOx SOLID SOLUTIONS IN AQUEOUS HF AND HF-HCL MIXTURES.
Revised ed.,
by M. E. Straumanis, K. C. Chuang, J. L. Ratliff, and W. J. James. 30 Oct 64, 6p
Technical rept. no. TR-12
Contracts Nonr229603, AT11 1 73, Proj. 5

Unclassified report

Pub. in Journal of the Electrochemical Society v112 n3 p262-6 Mar 1965 (Copies not available to DDC or Clearinghouse customers)
Revision of manuscript submitted 24 Jul 64.

Descriptors: (*Electrodes, Polarization), (*Titanium alloys, Oxides), (*Solid solutions, Electrochemistry), Hydrogen compounds, Fluorides, Hydrochloric acid, Anodes (Electrolytic cells), Decomposition, Reaction kinetics, Hydrogen, Oxygen, Thermodynamics.

TiO(x) electrodes coupled to platinum exhibited very low hydrogen evolution rates, V2, during anodic polarization in aqueous hydrofluoric acid as compared with V1, the open circuit rates. The difference, V1-V2, was independent of the HF concentration and of the composition of the TiOx electrodes within the compositional range 0-5% b.w. oxygen. Therefore, these TiOx alloys are polarizable to the same extent (polarizability about 81%) by equivalent current densities in hydrofluoric acid. A more pronounced effect (polarizability 82 to 138%) was observed for TiOx dissolving in HF-HCl mixtures. The difference, V1-V2, increased with both the oxygen content of the solid solution electrodes and the HCl concentration. It was found that the dissolution potential of TiOx electrodes in HF became more noble with time, with the increase of oxygen content of the alloys, and with the increasing concentration HCl in the HF-HCl mixtures as electrolytes. The dissolution potential became more active with increasing concentration of HF. In all cases, increasing anodic current density shifted dissolution potential strongly toward positive values. Interpretations of the various dissolution potential-changes are given in terms of protective layer formation. (Author)

AD-614 192 Div. 4

RIAS, Inc., Baltimore, Md.
LCAO-MO SCF CALCULATIONS OF C6O6 SYSTEMS,
by Joyce J. Kaufman. 27 Apr 64, 4p

Contract AF49 638 1220
AFOSR 65-0571

Unclassified report

Pub. in Journal of Physical Chemistry v68 n9 p2648-51 Sep 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cyclohexenes, Molecular properties), (*Organic oxygen compounds, Molecular properties), Molecular structure, Atomic orbitals, Field theory, Matrix algebra, Hamiltonian, Integrals, Electron transitions.

Simple Huckel MO calculations by West predicted a biradical nature for C6O6(-4), due to the degeneracy of molecular orbitals phi-8 and phi-9, while experiments showed C6O6(-4) to be diamagnetic. To test the sensitivity of the prediction to MO calculational methods, Pariser-Parr and Pople SCF calculations were performed for C6O6, C6O6(-2), and C6O6(-4). It is difficult to ascertain whether electron interaction terms alone are sufficient to destroy the calculated degeneracy of phi-8 and phi-9 since the evaluation of the elements of the configuration interaction matrix will be critically dependent on having accurate values for the integrals. Evaluating the configuration interaction matrix elements utilizing the integral values for a Pople SCF calculation of neutral C6O6 or C6O6(-2) indicates that electron interaction terms alone do not seem to be sufficient to make the singlet state be lower in energy than the triplet state. The calculational results indicate that for charged species it is not sufficient to use integral values derived from the neutral species, since this leads to physically unmeaningful results for the absolute energies of the species. It is suggested that the splitting of the degeneracy may possibly be due to a type of Jahn-Teller effect-which, however, must necessarily be weak since the electrons involved do not participate strongly in the binding of the molecule. (Author)

AD-614 195 Div. 4, 8, 30

Kansas Univ., Lawrence. Dept. of Chemistry.
OPERATIONAL AMPLIFIER CIRCUITS FOR CONTROLLED POTENTIAL CYCLIC VOLTAMMETRY, II,
by John R. Alden, James Q. Chambers, and Ralph N. Adams. 22 May 62, 9p
Contract AT11 1 686; Grant AF AFOSR62 14, Proj. 9763 37630
AFOSR 65-0527

Unclassified report

Pub. in Journal of Electroanalytical Chemistry v5 p152-7 1963 (Copies available only to DDC users).

Descriptors: (*Amplifiers, Circuits), (*Circuits, Amplifiers), (*Polarographic analysis, Instrumentation), (*Measuring devices (Electrical and Electronic), Polarographic analysis), Electrochemistry, Potentiometers, Voltmeters, Coupling circuits, Voltage, Scanning.

Several practical, inexpensive, operational amplifier (OA) circuits are described which are particularly useful in single sweep and cyclic voltammetry at stationary electrodes. Specific adaptations of OA's to electroanalytical instrumentation were made some time ago by Booman and coworkers and DeFord among others. Highly finished polarographic instruments have been designed by Kelly and coworkers. The instruments described herein are functional, devoid of multi-purpose appendages, and specifically oriented towards solid electrode applications. Their reliability has been proven by continuous operation for several years in a variety of modern electroanalytical operations. The units function satisfactorily with aqueous or non-aqueous electrochemical systems. The instruments consist of the basic OA potentiostat coupled with a cyclic voltage scanning input. Two forms of cyclic scanner are described, a mechanical or motor driven unit, and an OA integrator network which is more versatile. Cyclic voltammetry appears to have great utility, and, since any cyclic unit can be used for single sweep operation, no purpose is seen for building single sweep polarographs as such.

AD-614 207 Div. 4

Milan Univ. (Italy).
NEW TRIPHENYLPHOSPHINE HYDRIDES OF RHENIUM (Nuovi Idruri Trifenilfosfinici di Renio),
by Lamberto Malatesta, Maria Freni, and Venanzio Valenti. 19 Jun 64, 10p
Grant AF AFOSR64 9
AFOSR 65-0611

Unclassified report

Pub. in Dalla Gazetta Chimica Italiana v94 p1278-86 1964 (Copies available only to DDC users).

Descriptors: (*Metalorganic compounds, Synthesis (Chemistry)), (*Rhenium compounds, Metalorganic compounds), (*Phosphines, Synthesis (Chemistry)), Hydrides, Chemical properties, Spectra (Infrared), Nuclear magnetic resonance, Absorption spectrum, Italy.

The preparation and the properties of the rhenium triphenylphosphinehydrides, ReH5L2 and ReH5L3 (L = (PC6H5)3), are described. They are obtained by the reactions that allowed the isolation of the hydrides ReH3L2, ReH3L2 . 2C2H5OH and ReH3L4 previously prepared in these laboratories. They are cristalline, non-electrolyte diamagnetic substances and their I.R. and N.M.R. spectra are those expected on account of their hydridic sturcture. (Author)

AD-614 215 Div. 4

University Coll., London (England).
THE REARRANGEMENT OF AROMATIC N-NITRO-AMINES. PART III. THE ACID-CATALYSED REARRANGE-MENT OF N-NITROANILINE,
by D. V. Banthorpe, E. D. Hughes, and D. L. H. Williams. 28 Apr 64, 16p
Contract AF61 052 66, Proj. 9760 37600
AFOSR 65-0516

Unclassified report

Pub. in Journal of the Chemical Society, p5349-61 Dec 1964 (Copies available only to DDC users).

Descriptors: (*Aromatic compounds, Nitramines), (*Nitramines, Molecular isomerism), (*Sterochemistry, Nitramines), Catalysis, Reaction kinetics, Tracer studies, Acids, Organic nitrogen compounds, Nitrites, Deuterated compounds, Nitrobenzenes, Great Britain.

Kinetic, product, and tracer studies were made of the acid-catalysed rearrangement of isotopically normal and H(2)-labelled N-nitro- to o- and p-nitro-aniline over a wide range of acidity. The results are consistent with an intramolecular mechanism involving isomerisation to an N-nitrite and migration to the para-position by way of an ortho-linked C-nitrite. Other mechanisms are discussed. (Author)

AD-614 290 Div. 4

Wisconsin Univ., Madison.
A NOVEL REARRANGEMENT OF 1,2-BIS (TRIMETHYLSILYL)-HYDRAZINE,
by Robert E. Bailey and Robert West. 12 Sep 64, 1p
Grant AF AFOSR62 244
AFOSR 65-0534

Unclassified report

Pub. in Journal of the American Chemical Society, v86 p5369 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Silicon compounds, Molecular isomerism), (*Hydrazine derivatives, Molecular isomerism), Stereochemistry, Chemical reactions, Nuclear magnetic resonance.

A novel rearrangement was found involving migration of silicon from one nitrogen atom to another. If 1,2-bis (trimethylsilyl)-hydrazine is treated with 2 equiv. of n-butyllithium in tetrahydrofuran and then with 2 equiv. of methyl iodide, the reaction mixture is found to contain both the expected product, 1,2-bis(trimethylsilyl)1,2-dimethylhydrazine, and the rearranged product, 1,1-bis (trimethylsilyl)-2,2-dimethylhydrazine.

AD-614 291 Div. 4

Kansas Univ., Lawrence. Dept. of Chemistry.
VOLTAMMETRY AND ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF HALONITROBENZENE ANION RADICALS,
by Toyokichi Kitagawa, Thomas P. Layloff, and Ralph N. Adams. 11 Mar 63, 4p
Contract AT11 1 686; Grant AF AFOSR62 14, Proj. 9763 37630
AFOSR 65-0524

Unclassified report

Pub. in Analytical Chemistry, v35 n8 p1086-7 Jul 63 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Nitrobenzenes, Free radicals), (*Free radicals, Paramagnetic resonance), (*Halogen compounds, Nitrobenzenes), Electrochemistry, Fluorine compounds, Chlorine compounds, Bromine compounds, Iodine compounds, Reduction (Chemistry).

Electron paramagnetic resonance (EPR) spectra of halonitrobenzene anion radicals was studied, using unsubstituted nitrobenzene for comparison. The results are summarized in a table. Halonitrobenzenes were reduced using dimethylformamide containing 0.1M tetraethylammonium perchlorate as supporting electrolyte. It was found that all 3 iodonitrobenzenes lose their iodine, all 3 chloronitrobenzenes retain their chlorine, only the orthobromonitrobenzene loses the bromine, and only the ortho-fluoronitrobenzene retains the flourine. (Author)

AD-614 293 Div. 4, 14

University of Southern California, Los Angeles.
SOAP FILMS AND SOME PROBLEMS IN SURFACE AND COLLOID CHEMISTRY,
by Karol J. Mysels. 19 May 64, 11p
Contract AF49 638 309, Proj. 9761 37610
AFOSR 65-0517

Unclassified report

Pub. in Journal of Physical Chemistry v68 n12 p3441-8 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Soaps, Films), (*Surface properties, Soaps), (*Colloids, Soaps), Phase studies, Elasticity, Surface tension, Surface-active substances.

Once their behavior is understood, soap films become a powerful tool for the study of surface and colloidal phenomena. This is because their geometry is well defined, their monolayer structure is relatively simple, and their behavior is easily observed. The formation and evolution of relatively thick films are controlled by ordinary hydrodynamics, without any indication of the existence of rigidified aqueous layers near the surface. Thinner films show the effect of both double-layer repulsion and van der Waals attractions. These forces balance at a thickness of the order of 100 A. Some problems in the interpretation of recent measurements of these equilibrium thicknesses and some approaches leading to further information about these forces are discussed. Under certain conditions the films thin even further to about 45 A. This is a thermodynamically stable state, which, though first observed by Newton, is still far from understood. (Author)

AD-614 304 Div. 4, 3

Army Chemical Research and Development Labs., Edgewood Arsenal, Md.
REACTIONS OF ISOPROPYL METHYLPHOSPHONOFLUORIDATE WITH SUBSTITUTED PHENOLS. II,
by Joseph Epstein, Harry O. Michel, David H. Rosenblatt, Robert E. Plapinger, and Ralph A. Stephani.
Mar 65, 11p Rept. no. CRDL-SP-3-21
Task 1C622401A09501

Unclassified report

Pub. in Journal of the American Chemical Society v86 p4959-61 Nov 20 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*G agents, Chemical reactions), (*Organic phosphorus compounds, Chemical reactions), (*Phenols, Chemical reactions), Amines, Fluorine compounds, Ions, Esters, Reaction kinetics, Stereochemistry, Thermochemistry.

The report describes further studies on the 'charge' effect found in the reaction of isopropyl methylphosphonofluoridate (GB) with various phenolic anions (see also AD-613 910). The incorporation of a cationic site into the phenolic nucleus increased the reactivity of the anion relative to its basic strength. The classes of compounds reported are mono- and bis-(dimethylaminomethyl)phenols, -catechols, and -pyrogallols. The general phenomenon of the charge effect was established in the hydroxybenzenes. The effect was shown to be additive in that each cationic site contributes to an increase in reactivity, and the magnitude of the increase is related to the distance of separation of the cationic and anionic sites. The charge effect is another previously unrecognized factor to be considered in any discussion involving nucleophilic activity. (Author)

AD-614 350 Div. 4, 16

Walter Reed Army Inst. of Research, Washington, D. C.
SYNTHESIS OF ETHYL p-NITROPHENYL ALPHA-METHOXYALKYL-PHOSPHONATES,
by L. S. Hafner, M. V. Garrison, J. E. Brown, and B. H. Alexander. 6 Nov 64, 3p

Unclassified report

Pub. in Journal of Organic Chemistry (U. S.) v30 p677-9 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Phosphonic acids, Esters), (*Organic phosphorus compounds, Synthesis (Chemistry)), Nitrophenols, Molecular structure, Hydrolysis, Drugs.

Synthesis of a new class of organophosphorus compounds, ethyl p-nitrophenyl alpha-methoxyalkylphosphonates, is reported. The compounds were prepared via the Michaelis-Arbuzov reaction of diethyl p-nitrophenyl phosphite and alpha-chloroalkyl methyl ethers. Confirmation of structure of the compounds was ascertained by hydrolysis to the known crystalline alpha-hydroxybenzylphosphonic acid, isolated as the aniline salt. (Author)

AD-614 376 Div. 4

Duke Univ., Durham, N. C.
DENSITY OF LIQUID HELIUM-3 BETWEEN 0.045 AND 1.3K,
by John E. Rives and Horst Meyer. 7 Aug 61, 3p
Unclassified report

Pub. in Physical Review Letters (U. S.) v7 n6 pV519 1-3-3 Sep 15 1961 (Copies not available to DDC or Clearinghouse customers).
Supported by NSF, Alfred P. Sloan Foundation, and OOR.

Descriptors: (*Helium, Density), (*Liquefied gases, Helium), Cryogenics, Measurement, Entropy.

The density of liquid helium-3 was measured = at various pressures up to 28.0 atm in the temperature range between 0.045 and 1.3K. At pressures above about 15 atm, an unexpected minimum in density was found to occur, the temperature of this minimum increasing to 0.09K when the pressure is increased to 28 atmospheres. For a pressure of 0.18 atm and below 0.08K the coefficient of expansion was found to be proportional to T.

AD-614 382 Div. 4

Walter Reed Army Inst. of Research, Washington, D. C.
USE OF HIGHLY ACID SUPPORTING ELECTROLYTES IN POLAROGRAPHY. OBSERVED CHANGES IN POLAROGRAPHIC WAVES OF SELENIUM (IV) UPON STANDING,
by Gary D. Christian, Edward C. Knoblock, and William C. Purdy. 1965, 3p
Unclassified report

Pub. in Analytical Chemistry v37 n3 p425-7 Mar 1965 (Copies not available to DDC or Clearinghouse customers).
Prepared in cooperation with Maryland Univ., College Park.

Descriptors: (*Polarographic analysis, Sulfuric acid), (*Sulfuric acid, Polarographic analysis), (*Selenium, Polarographic analysis), Electrolytes, Perchloric acid, Inorganic acids, Electrodes, Mercury, Ions, Nitrogen, Acids, Dissociation.

High concentrations of sulfuric acid supporting electrolytes were used for polarographic determinations of selenium in biological samples. In 3M sulfur acid the second selenium wave decreased in height upon standing in the polarographic cell under nitrogen with mercury dropping through the solution; the wave eventually disappeared completely. The wave also shifted to slightly more negative potentials as it decreased in height. Sometimes a milky precipitate occurred with these changes but this was not always the case. Observed changes have been shown to be due to reaction of free mercury ions with intermediate reduction products of the selenium; the free mercury ions are formed from acid dissolution of the mercury electrode.

AD-614 396 Div. 4, 16, 32
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
APPROXIMATE ENZYMIC METHOD OF MICROANALYSIS FOR IDENTIFYING RESIDUAL AMOUNTS OF ORGANO-PHOSPHORUS INSECTICIDES,
by A. A. Pokrovskii and L. G. Ponomareva.
30 Mar 65, 17p FTD-TT-65-96
TT 65-62072
Unclassified report

Unedited rough draft trans. of Gigiena i Sanitariya (USSR) v29 n8 p53-60 1964.

Descriptors: (*Organic phosphorus compounds, Insecticides), (*Microanalysis, Organic phosphorus compounds), (*Insecticides, Chemical analysis), Enzymes, Cholinesterase inhibitors, Portable, Chemical indicators, Cholines, Cholinesterase, USSR.

A simple, highly sensitive group method of detecting phosphorus-containing insecticides in various objects of the surroundings, based on their inherent anticholinesterase action, was developed. In order to realize this method a portable kit was constructed which contains a rack for the storage of ampouled reagents. The kit contains enough reagents for 100 analyses. The detection of insecticides may be performed under field conditions. A preliminary determination of insecticide contamination of products may be obtained in 10 - 20 min. The anticholinesterase effect of 6 of the most important insecticides was studied and calibration curves were constructed for their determination. The method (without preliminary activation) makes it possible to determine from 1 to 100 micrograms of insecticide per 1 ml. It was established that the anticholinesterase activity of chlorphos when dissolved in buffer solutions of pH 7.4 and under the action of plant extracts gradually increases. This is evidently explained by a conversion of the insecticide into a compound possessing high anticholinesterase activity. (Author)

AD-614 473 Div. 4, 14
CFSTI Prices: HC$3.00 MF$0.75

Midwest Research Inst., Kansas City, Mo.
SYNTHESIS OF ELASTOMERS CONTAINING Si-N BONDS IN THE MAIN CHAIN.
Final technical rept. for 29 Jun 61-26 Feb 65,
by L. W. Breed and R. L. Elliott. 26 Feb 65, 57p
Contract DA23 072ORD1687, Projs. 2531C, 593 32 002
Unclassified report

See also AD-282 206, AD-409 894, and AD- 432 392.

Descriptors: (*Elastomers, Synthesis (Chemistry)), (*Silanes, Polymers), (*Silicone plastics, Synthesis (Chemistry)), (*Organic nitrogen compounds, Elastomers), (*Silicon compounds, Polymerization), Polycyclic compounds, Heterocyclic compounds, Monocyclic compounds, Heat-resistant plastics, Condensation reactions, Molecular isomerism, Hydrolysis, Stability, Thermal stresses, Spectra (Infrared), Siloxanes, Peroxides, Cyanates, Amines.

Methods were sought for the synthesis of thermally and hydrolytically stable elastomers based on chains containing silicon atoms bonded directly to nitrogen. Classes of silazane polymers studied include condensed bis(aminosilyl)diazasilacyclopentanes, the products of the reaction of N-substituted cyclosilazanes and cyclosiloxazanes with organic diols, and polymers that can be derived from silylpiperazines, p-phenylenebis-(alkylaminosilanes), and N-silylated-cyclosilazanes. High molecular weight condensation products of organic diols

and N-substituted cyclosilazanes and siloxazanes with reasonably good hydrolytic stability and heat stability were obtained, but a satisfactory crosslinking procedure could not be fond. Methods of synthesis and characterization of monomers are described, and structural modifications necessary to improve the hydrolytic stability of the silazane linkage are defined. (Author)

AD-614 476 Div. 4
CFSTI Prices: HC$1.00 MF$0.50

Virginia Polytechnic Inst., Blacksburg.
THE OXIDATION OF ARSENIC (III) AND ANTIMONY (III).
Final progress rept. for 1 Feb 63-1 Feb 65,
by John G. Mason. 1 Feb 65, 19p
Grant AF AFOSR210 63
AFOSR 65-0662

Unclassified report

Descriptors: (*Arsenic, Oxidation), (*Antimony, Oxidation), Reaction kinetics, Chromium compounds, Perchloric acid, Solutions, Acetates, Buffers, Phosphates, Ammonium compounds, Nitrates, Catalysis, Oxidizers.

The kinetics of the Cr(VI)-As(III) reaction have been measured in perchloric acid solutions, acetic acid solutions, acetoc acid-acetate buffers, NH4NO3, and H2PO4 - HPO4 buffers. The reaction shows catalysis by H(+), and HOAc. The general form of the rate laws is given. In phosphate buffers, a Cr(VI).H2PO4 complex is indicated as an oxidizing agent.

AD-614 491 Div. 4

Kansas State Univ., Manhattan.
NONBENZENOID AROMATIC SYSTEMS. I. SYNTHESIS OF 1-VINYLAZULENE AND CERTAIN SUBSTITUTED 1-VINYLAZULENES,
by Richard N. McDonald and Wilford S. Stewart.
22 Jun 64, 5p
Grant AF AFOSR145 65, NSF G17430
AFOSR 65-0537

Unclassified report

Pub. in Journal of Organic Chemistry v30 p270-3 Jan 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Aromatic compounds, Synthesis (Chemistry)), (*Cyclopentanes, Synthesis (Chemistry)), Aldehydes, Nuclear magnetic resonance, Spectra (Visible and Ultraviolet), Molecular isomerism.

The synthesis of 1-vinylazulene, cis- and trans-beta-phenyl-1-vinylazulene, and trans-beta-phenyl-3-vinylguaiazulene by the Wittig reaction are reported. Their physical and spectral properties, and their reactivities (or lack thereof) are discussed. (Author)

AD-614 498 Div. 4, 14

National Research Council of Canada, Ottawa (Ontario). Div. of Applied Chemistry.
ANIONIC POLYMERIZATION OF BUTADIENE AND STYRENE.
Revised ed.,
by A. F. Johnson and D. J. Worsfold. 8 Jun 64, 8p
Rept. no. NRC-8256

Unclassified report

Pub. in Journal of Polymer Science: Part A v3 p449-55 Feb 1965(Copies not available to DDC or Clearinghouse customers).
Revision of manuscript submitted 15 Apr 64.

Descriptors: (*Polymerization, Reaction kinetics), (*Styrene plastics, Polymerization), (*Butyl rubber, Polymerization), Cyclohexanes, Solvents, Metalorganic compounds, Lithium compounds.

A kinetic study was made of the polymerization of butadiene and styrene in an aliphatic hydrocarbon solvent with the use of butyllithium as an initiator. It is shown that the anomalous behavior in the initiation reaction exhibited by isoprene under these conditions is also found for these two monomers. These monomers give a sigmoidal rate curve in the initiation reaction in cyclohexane solution, and the reaction appears to be auto-catalytic. The propagation reactions were studied also, and the results compared with the rather discordant sets of data published by other authors. (Author)

AD-614 500 Div. 4

National Research Council of Canada, Ottawa (Ontario) Div. of Applied Chemistry.
PHOTOCHEMICAL ADDITION OF HYDROGEN BROMIDE TO 2-BUTENE IN THE GAS PHASE,
by G. A. Oldershaw and R. J. Cvetanovic. 10 Aug 64, 7p Rept. no. NRC-8220

Unclassified report

Pub. in Journal of Chemical Physics (U. S.) v41 n11 p3639-44 Dec 1 1964(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Photochemistry, Cyclobutenes), (*Cyclobutenes, Photochemistry), (*Hydrogen compounds, Bromides), Phase studies, Gases, Molecular isomerism, Free radicals.

The relative rates of the photochemical addition of hydrogen bromide to 2-butene, and of the simultaneous cis-trans isomerization have been measured in the gas phase at 54C. Similar but less extensive experiments have been carried out with 1,2-dideuteroethylene. In this case, comparison of the rates with the data in the literature indicates much faster cis-trans isomerization than can be expected from the decomposition of thermalized bromoethyl radicals. Alternative explanations of the fast geometric isomerization are briefly discussed. (Author)

AD-614 502 Div. 4, 25

National Research Council of Canada, Ottawa (Ontario). Div. of Applied Chemistry.
COLLISIONAL DEACTIVATION OF THE EXCITED SINGLET OXYGEN ATOMS AND THEIR INSERTION INTO THE CH BONDS OF PROPANE,
by Hideo Yamazaki and R. J. Cvetanovic. 15 Jul 64, 9p NRC 8219

Unclassified report

Pub. in Journal of Chemical Physics v41 n12 p3703-10 Dec 15 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Oxygen, Photochemistry), (*Hydrocarbons, Oxygen), Electron transitions, Atomic energy levels, Spins, Chemical reactions, Excitation, Alcohols.

Reaction of the excited singlet oxygen atoms with propane was studied at room temperature and at pressures from 400 to 6400 mm. Three main processes were observed: (1) insertion of the excited singlet atoms into CH bonds,

(2) abstraction of hydrogen atoms, and (3) fragmentation of the paraffin. The yields of the insertion products increased approximately linearly with the pressure, the abstraction products remained almost constant and the fragmentation products decreased. The primary step is the insertion of the excited singlet oxygen atoms into the CH bonds of propane to form 'hot' alcohol molecules. When gases capable of deactivating the excited atoms are added, the insertion and fragmentation decrease and the secondary hydrogen atoms are preferentially abstracted. From the increased discrimination in hydrogen abstraction the following relative rates (k sub 2/k sub 3) of the electronic deactivation of the excited singlet oxygen atoms by different gases have been obtained: Xe 0.47, N20.15, Kr 0.05, and He and SF6 close to zero. (Author)

AD-614 505 Div. 4

National Research Council of Canada, Ottawa (Ontario) Div. of Pure Physics.
FREE RADICALS BY MASS SPECTROMETRY. XXXII. THERMAL DECOMPOSITION OF CYCLOPENTYL RADICALS,
by T. F. Palmer and F. P. Lossing. 15 Jul 64, 6p
Rept. no. NRC-8143

Unclassified report

Pub. in Canadian Journal of Chemistry v43 p565-9 1965 (Copies available only to DDC users).

Descriptors: (*Cyclopentanes, Dissociation), (*Free radicals, Mass spectroscopy), Cyclopentenes, Hydrogen, Atoms, High-temperature research, Canada.

At low pressures and elevated temperatures cyclopentyl radicals are found to dissociate mainly by two modes of reaction: about 34% by loss of H atom to form cyclopentene, and about 66% by a C-C bond rupture to form ethylene and allyl radicals. Under the conditions employed no evidence for a third possible mode, the loss of H2 to form cyclopentenyl radical, could be found. It is estimated that an incidence of 2% of the latter could have been detected. (Author)

AD-614 509 Div. 4

National Research Council of Canada, Ottawa (Ontario). Div. of Applied Chemistry.
CO-CATELYSES IN FRIEDEL-CRAFTS REACTIONS. PART VII. THE FORMATION OF ULTRAVIOLET CHROMOPHORES,
by J. M. Roberts. 10 Feb 64, 10p

Unclassified report

Pub. in the Journal of the Chemical Society p310-8 Jan 1965 (Copies available only to DDC users).

Descriptors: (*Alkenes, Friedel-crafts reactions), Ultraviolet spectroscopy, Absorption spectrum, Isomeric transitions, Polymerization, Catalysis, Boron compounds, Fluorides, Carboxylic acids, Solvents, Halogenated hydrocarbons.

Solutions of butene in ethylene dichloride with boron trifluoride and hydroxylic co-catalysts slowly develop an absorption band with a peak at 304 ± 2 m micron, in addition to isomerising and polymerising. The kinetics of peak growth show that the band is not due to an intermediate in the isomerisation or polymerisation reactions, but may be due to alkylated alkenyl cations, formed by hydride abstraction from butene or unsaturated polybutene by aliphatic carbonium ions. The ultraviolet spectra obtained from conjugated dienes in acid solutions closely resemble those obtained from butene in the solutions described above. (Author)

AD-614 513 Div. 4, 16

Atlantic Regional Lab., Halifax (Nova Scotia).
PHENOLIC ACIDS AND LIGNINS IN THE LYCOPODIALES,
by G. H. N. Towers and W. S. G. Maass. 7 Jul 64, 11p
NRC-8239

Unclassified report

Pub. in Phytochemistry v4 n1 p57-66 1965
(Copies available only to DDC users).

Descriptors: (*Plants (Botany), Phenols), (*Phenols, Plants (Botany)), (*Lignins, Plants (Botany)), Acids, Ketones, Aldehydes, Wood, Sucrose, Oxidation, Degradation.

Twenty-one species and varieties of Lycopodium have been examined for phenolic acids and for phenolic aldehydes, ketones and acids obtained on ethanolysis or alkaline oxidation of their extracted wood-meals. p-Hydroxybenzoic, vanillic, p-coumaric and ferulic acids were identified in phenolic acid fractions and p-hydroxybenzaldehyde, vanillin, acetovanillone, vanilloyl methyl ketone, alpha-hydroxy- and alpha-ethoxypropiovanillone were identified among the products of lignin degradation. Those species which are included in the genera Lycopodium and Diphasium, as proposed by Rothmaler, were found to yield syringic acid in the ethanol-soluble fraction and on degradation of lignin whereas species included in the genera Huperzia and Lepidotis did not. Syringaldehyde was not obtained on alkaline oxidation of the lignin of any species thus indicating that Lycopodium s. lat. has essentially a gymnospermous type of lignin. Sucrose was identified as the major carbohydrate in ethanolic extracts. (Author)

AD-614 516 Div. 4, 25

National Research Council of Canada, Ottawa (Ontario), Div. of Applied Chemistry.
EFFECT OF PRESSURE ON THE HYDROLYSIS OF METHYL ACETATE AND ETHYLENE OXIDE IN ACETONE + WATER MIXTURES: QUANTITIES OF ACTIVATION AT CONSTANT VOLUME, AND THE ISOKINETIC PRESSURE,
by B. T. Baliga, R. J. Withey, D. Poulton, and E. Whalley. 10 Aug 64, 15p NRC-8261

Unclassified report

Pub. in Transactions of the Faraday Society v61 n507 pt3 p517-30 Mar 65.
(Copies available only to DDC users).

Descriptors: (*Hydrolysis, Pressure), (*Ethylene oxide, Hydrolysis), (*Acetates, Hydrolysis), Catalysis, Solvents, Ketones, Water, Heat of activation, Entropy, Enthalpy, Canada.

The extension of the concept of isokinetic conditions into the dimension of pressure is discussed. The use of the enthalpy and entropy of activation at constant pressure and of the energy and entropy of activation at constant volume to characterize activated processes is discussed, and it is concluded that neither set can be rigorously justified as easier to understand, but that the constant-volume parameters are probably to be preferred most of the time. The effect of pressure up to 3 kbar on the rate of the acid-catalyzed hydrolysis of methyl acetate and ethylene oxide in acetone+water mixtures was measured. The constant-volume parameters of activation for the acid-catalyzed hydrolysis of methyl acetate vary with solvent in a less complicated way than the constant-pressure parameters, the minima in the constant-pressure parameters not being present in the constant-volume parameters. The existence of the minima in the constant-pressure parameters is ascribed mainly to

the large change of thermal expansivity when an organic liquid is added to water. The effect of solvent on the rate of hydrolysis of methyl acetate is dependent on the pressure, and reverses sign at about 2 kbar. The implications of this observation in the determination of reaction mechanisms is discussed. (Author)

AD-614 517 Div. 4, 25

National Research Council of Canada, Ottawa (Ontario). Div. of Pure Chemistry.
EXCESS THERMODYNAMIC FUNCTIONS FOR LIQUID MIXTURES OF METHANE+PROPANE,
by A. J. B. Cutler and J. A. Morrison. 5 Aug 64, 15p NRC-8267

Unclassified report

Pub. in Transactions of the Faraday Society v61 n507 pt3 p429-42 Mar 1965 (Copies available only to DDC users).

Descriptors: (*Methane, Thermodynamics), (*Aliphatic compounds, Thermodynamics), (*Thermodynamics, Aliphatic compounds), Mixtures, Liquefied gases, Cryogenics, Low-temperature research, Vapor pressure, Vaporization, Equations of state.

The vapor pressures and heat capacities of liquid mixtures of methane+propane and the heats of vaporization of methane from the mixtures have been measured in the temperature range 90 to 110K. The experimental data have been used to obtain the activity coefficients of methane, the excess Gibbs energy, the heat of mixing and the excess heat capacity. The results are compared with the quasi-lattice theory of liquid mixtures of molecules of different size and with the consequences of the principle of corresponding states applied to liquid mixtures of chain molecules. The theoretical treatments yield values of the excess Gibbs energy and the heat of mixing which are in good agreement with experiment, but the agreement is less satisfactory for the excess heat capacity. (Author)

AD-614 518 Div. 4, 2

National Research Council of Canada, Ottawa (Ontario). Div. of Pure Physics.
LABORATORY INVESTIGATIONS OF THE INTERSTELLAR RADIO-FREQUENCY LINES OF CH AND OTHER MOLECULES,
by A. E. Douglas and G. A. Elliott. 25 Nov 64, 8p NRC-8268

Unclassified report

Pub. in Canadian Journal of Physics v43 p496-502 Mar 1965 (Copies available only to DDC users).

Descriptors: (*Hydrocarbons, Interstellar matter), (*Interstellar matter, Radiofrequency spectroscopy), (*Molecular spectroscopy, Hydrocarbons), Radio astronomy, Electron transitions, Molecular rotation.

The 0-0 band of the 2 delta-2Π transition of CH has been remeasured from high-dispersion plates and more precise values of the lambda doubling in the 2Π state have been determined. From these optical measurements, the transition between the two components of the lowest rotational level can be predicted to lie at 3 400 Mc/sec. The possibility of finding CH and also other molecules in interstellar space by radio-frequency astronomical observations is discussed. (Author)

AD-614 524 Div. 4

Prairie Regional Lab., Saskatoon (Saskatchewan).
MINOR COMPONENTS OF THE OIL OF ARAUCARIA,
by E. von Rudloff. 2 Oct 64, 1p NRC-8273

Unclassified report

Pub. in Chemistry and Industry p2126-7 1964 (Copies available only to DDC users).

Descriptors: (*Melanesia, Vegetable oils), (*Vegetable oils, Melanesia), Trees, Decomposition, Terpenes, Alcohols, Chromatographic analysis, Canada.

It was shown previously (Chem. and Ind., 1962, 743) that the major constituent (component V, 50.5%) of the oil of araucaria (wood oil of the New Caledonian conifer Neocallitropsis araucarioides (Compt.) Florin syn. Callitropsis araucarioides Compt.) is a mixture of alpha- and beta-eudesmol and that component II (8%) is guaiol. Bates and Hendrickson (Chem. and Ind., 1962, 1759) have reported that component III (19.5%), from which a small amount of alpha-cadinol was isolated, was mainly gamma-eudesmol. It has now been found that component I (2%) is elemol and that component VI (18%) consists mainly of a new sesquiterpene alcohol, for which the name 'araucariol' is proposed. The present finding of fairly large amounts of araucariol, which has a carbon skeleton different from that of the eudesmols, guaiol or elemol, as well as small amounts of cadalene precursors, indicate that in the oil of araucaria biogenesis of sesquiterpenes does not arise solely from transfarnesol.

AD-614 530 Div. 4, 25

Minnesota Univ., Minneapolis.
TEMPERATURE DEPENDENCE OF THE LIFETIME OF PHOSPHORESCENCE OF SOME POLYNUCLEAR HYDROCARBONS IN VISCOUS SOLUTION,
by Thomas H. Jones and Robert Livingston. 19 Jun 64, 10p
AROD 2397:5

Unclassified report

Pub. in Transactions of the Faraday Society v60 n504 pt12 p2168-76 Dec 1964 (Copies available only to DDC users).

Descriptors: (*Hydrocarbons, Phosphorescence), (*Phosphorescence, Hydrocarbons), Temperature, Cryogenics, Low-temperature research, Heat of activation, Solvents.

In viscous solutions, the rate of decay of the triplet state, as followed by phosphorescence measurements, is a strong function of temperature at normal temperatures and becomes nearly independent of temperature at low temperatures. The experimental data were described best by an equation of the form: $k = a+bT \exp(-E(1)/RT)+cT \exp(-E(2)/RT)$, where a is the limiting value of the rate constant at low temperatures, and b and E(1), and c and E(2) are the low- and high-temperature pre-exponential factors and activation energies, respectively. The rates of decay of phosphorescence of several aryl hydrocarbons and some halonaphthalenes in viscous solutions were measured at temperatures ranging from 77K to room temperature. In all cases the high-temperature activation energies were less than the corresponding activation energies for the variation of the solvent viscosity with temperature. (Author)

AD-614 538 Div. 4, 25

Kansas Univ., Lawrence. Dept. of Chemistry.
APPLICATION OF ELECTRON PARAMAGNETIC RESONANCE TECHNIQUES IN ELECTROCHEMISTRY,
by Ralph N. Adams. 3 Apr 64, 14p
Contract AT11 1 686 38; Grant AF AFOSR62 14,
Proj. 9763 37630
AFOSR 65-0530

Unclassified report

Pub. in Journal of Electroanalytical Chemistry v8 p151-62 1964 (Copies available only to DDC users).

Descriptors: (*Electrochemistry, Paramagnetic resonance), (*Paramagnetic resonance, Electrochemistry), Ions, Free radicals, Oxidation-reduction reactions, Spectroscopy.

The roles of electrochemistry and electron paramagnetic resonance (EPR) are discussed, including the contributions of each technique to the problems of the other. EPR has contributed to electrochemistry by (1) the detection and identification of radical intermediates in electrode reactions and (2) providing information about solution interactions of radical ions which contribute to a fuller understanding of these entities as oxidation-reduction intermediates. Electrochemistry has contributed to EPR, especially in the generation of anion radicals, by offering wider range of experimental conditions than previously available. (U) (Author)

AD-614 540 Div. 4

Mellon Inst., Pittsburgh, Pa.
CYCLOPENTADIENYLCOBALT CARBONYL DIIODIDE,
by R. B. King. 5 Oct 64, 1p
Grant AF AFOSR580 64
AFOSR 65-0540

Unclassified report

Pub. in Zeitschrift fur Naturforschung v19 n12 p1160 1964 (Copies available only to DDC users).

Descriptors: (*Cyclopentanes, Cobalt compounds), (*Cobalt compounds, Metalorganic compounds), Iodides, Synthesis (Chemistry).

Monomeric cyclopentadienylcobalt dicarbonyl, C5H5Co(CO)2, reacts readily with iodine in diethyl ether solution at room temperature evolving carbon monoxide and precipitating black crystalline cyclopentadienylcobalt carbonyl diiodide, C5H5CoCOI2 (Anal.: Calcd.: C, 17.8; H, 1.2; Co, 14.5; I, 62.5; O, 3.9; mol. wt., 406. Found: C, 18.3; H, 1.3; Co, 14.6; I, 63.2; O, 3.0; mol. wt., 398 (osmometer in benzene solution)).

AD-614 544 Div. 4

Duke Univ., Durham, N. C.
RING METALATION OF DIMETHYLAMINOMETHYLFERROCENE WITH BUTYLLITHIUM AND CONDENSATIONS WITH ELECTROPHILIC COMPOUNDS. SYNTHESIS OF 1,2-DISUBSTITUTED FERROCENES,
by D. W. Slocum, B. W. Rockett, and C. R. Hauser.
21 Sep 64, 7p
Grant DA ARO D31 124G409
AROD 3581:7

Unclassified report

Pub. in Journal of the American Chemical Society v87 n6 p1241-6 Mar 20 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ferrocenes, Metalation), (*Metalation, Ferrocenes), (*Condensation reactions, Ferrocenes), Monocyclic compounds, Lithium compounds, Amines, Iodides, Ketones, Nitriles, Esters, Solvents, Spectra (Infrared), Nuclear magnetic resonance.

N,N-Dimethylaminomethylferrocene (I) was metalated with n-butyllithium in ether-hexane, and the resulting monolithioamine was condensed with benzophenone, acetone, benzonitrile, and phenyl isocyanate to form the corresponding 2-derivatives. The methiodide (II) of the benzophenone adduct was cyclized by means of potassium amide to give the cyclic ether. Methiodide II was also treated with potassium hydroxide and potassium cyanide to afford the diol and carbinol-nitrile, respectively. Amine I was metalated with excess n-butyllithium in THF-hexane and the resulting intermediates were condensed with benzophenone to yield mainly the 2,1'-derivative; also some of the 2- and the 1'-derivatives were formed. These results furnish a route to the synthesis of a number of new 1,2-disubstituted and 1,2,1'-trisubstituted ferrocenes. Amine I underwent lithiation more readily than ferrocene. In THF-hexane, amine I was converted primarily to a dilithioamine. Some infrared and n.m.r. spectral correlations of 1,2-disubstituted ferrocenes are discussed. (Author)

AD-614 547 Div. 4

Florida State Univ., Tallahassee.
ARYL BORON FREE RADICALS,
by J. E. Leffler, E. Dolan, and T. Tanigaki.
28 Dec 64, 1p
Grants DA AROD31 124G355, DA AROD31 124G373
AROD 3605:1

Unclassified report

Pub. in Journal of the American Chemical Society v87 p927 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Free radicals, Boron compounds), (*Boron compounds, Free radicals), Fluorides, Chlorides, Sodium alloys, Potassium alloys, Anhydrides, Polycyclic compounds, O-Heterocyclic compounds.

Dimesitylboron fluoride in DME (1,2-dimethoxyethane) reacts with sodium-potassium alloy to give dimesitylboron radical (1). The radical 1 is stable in degassed DME for at least 4 months, as shown by the persistence of its e.s.r. spectrum. Trimesitylboron will also react with alkali metals in DME or in THF to give radicals. The reaction of the less hindered diphenylboron chloride in DME with sodium-potassium alloy is more involved. E.s.r. series terminating in the spectrum of the biphenyl anion radical are observed in experiments starting with triphenylboron or diphenylborinic anhydride in place of diphenylboron chloride. The cleavage of aryl groups from aryl boron is supported not only by the formation of 1 from trimesitylboron but also by the isolation of phenylboronic anhydride in trapping experiments with mixtures of radicals from diphenylboron chloride. In a univalent intermediate such as phenylboron the two nonbinding electrons can occupy a low energy 2s orbital.

AD-614 548 Div. 4, 25

Cornell Univ., Ithaca, N. Y.
VIBRATIONAL EXCITATION IN SOME FOUR-CENTER TRANSITION STATES,
by S. H. Bauer and E. L. Resler, Jr. 5 Aug 64, 4p
Contracts AF49 638 716, AT30 1 3211

Unclassified report

Pub. in Science v146 n3647 p1045-8 Nov 20 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Deuterium, Substitution reactions), (*Substitution reactions, Deuterium), (*Hydrogen, Deuterium), (*Excitation, Deuterium), Dissociation, Displacement reactions, Heat of activation, Atomic energy levels, Shock tubes.

The rates of substitution of deuterium for hydrogen in homogeneous gas phase reactions between D2 and HX (X = H, Cl, NH2, or HS) were measured at high temperatures by single-pulse shock tube techniques. The magnitudes observed and their dependency on concentration indicate that the rates of exchange are much faster than would be attainable were the deuterium to dissociate and the D atoms to react with HX by atomic displacement to produce H + DX. Also, these rates were not limited by methathesis through four-center transition states generated by sufficiently energetic collisions between the principal reactants. The results are compatible with the assumption that the rates are controlled by the populations of D2 in about its 6th vibrational energy level. (Author)

AD-614 551 Div. 4, 14

Pacific Naval Lab., Esquimault (British Columbia).
PROBLEMS OF ADHESION WITH CATHODIC PROTECTION,
by W. Arthur Anderton. 1964, 16p Reprint 64-11
Unclassified report

Pub. in Official Digest v36 n477 p1210-24 Oct 1964
(Copies not available to DDC or Clearinghouse customers).
Rept. appeared in the Apr 64 preprint booklet of the American Chemical Society, Div. of Organic coatings and Plastics Chemistry., Washington, D. C.

Descriptors: (*Adhesion, Vinyl plastics), (*Vinyl plastics, Organic coatings), (*Ship hulls, Organic coatings), (*Cathodic protection, Ship hulls), Paint primers, Antifouling coatings.

Loss of adhesion and blistering of vinyl bottom systems has been a problem on the cathodically protected ships of the Royal Canadian Navy. This problem has been studied in the laboratory where it has been observed that on cathodically protected panels there is a progressive loss of adhesion originating at a coating break. An account is given of studies of the observed phenomena and experimental work to support some of the proposed explanations. (Author)

AD-614 555 Div. 4, 25

California State Coll., Long Beach. Dept. of Chemistry.
THERMODYNAMIC PROPERTIES OF AQUEOUS SOLUTIONS OF MIXED ELECTROLYTES. THE HYDROCHLORIC ACID-POTASSIUM CHLORIDE SYSTEM FROM 40 TO 0C,
by J. H. Stern, C. W. Anderson, and A. A. Passchier.
18 Jul 64, 4p
AROD 3956:4
Unclassified report

Pub. in Journal of Physical Chemistry v69 n1 p207-10 Jan 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Heat of solution, Electrolytes), (*Electrolytes, Thermodynamics), (*Hydrochloric acid, Thermodynamics), (*Potassium compounds, Chlorides), Solutions, Mixtures, Thermochemistry, Entropy, Specific heat.

Heats of mixing of equimolal solutions of HCl and KCl at 2 and 3 m concentrations, respectively, were determined calorimetrically at 40, 25, 10, and 0C and fitted to an equation based on Harned's rule. Excess free energies were calculated from e.m.f. measurements and combined with heats of mixing to yield excess entropies. The results are interpreted via the Bronsted-Guggenheim theory of specific interaction. Apparent molal heat capacities of mixed HCl-KCl and HCl-NaCl solutions at 25C are also given. (Author)

5. Communications

AD-613 944 Div. 5
CFSTI Prices: HC$3.00 MF$0.75

Naval Research Lab., Washington, D. C.
TARGET CAPABILITY VERSUS PRESUMED INTENTION AS A BASIS FOR DECISION IN COMBAT INFORMATION CENTERS.
Final rept.,
by D. C. Burdick and A. E. Goins. 12 Mar 65, 99p
Rept. no. NRL-6180
Proj. RF005 01 41 4301

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Combat information centers, Decision making), Targets, Display systems, Simulation, Command and control systems.

The use of the opposing factors of target capability and target presumed intention as bases for decision by a sample of 131 CIC decision makers in 60 abstract tactical situations depicted by static displays was examined. Very wide differences in strategy and trade-off points were observed, with most decision makers weighting presumed intention more heavily. In comparison with rank and job experience, the CIC school attended was the most important factor correlating with decision strategy. Considerations of the subject's consistency in his decisions, difficulty of problem, and the subject's stated confidence in his decisions are discussed. (Author)

AD-613 964 Div. 5, 6, 8
CFSTI Prices: HC$8.00 MF$2.25

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
RADIO AND RADAR TECHNOLOGY AND ITS APPLICATION,
by K. M. Listov and K. N. Trofimov.
12 Feb 65, 496p FTD-MT-64-60
TT 65-61976

Unclassified report

Edited machine trans. of mono. Radio i Radiolokatsionnaya Tekhnika i Ikh Primenenie, Moscow, 1960, 423p. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Radio communication systems, Reports), (*Radar, Reports), Radio equipment, Radio transmission, Radio reception, Radio waves, Propagation, Radio relay systems, Radio navigation, Radar stations, Radar equipment, Detection, Attenuation, Infrared scanning, Warning systems, Meteorological radar, Radar jamming, Antiaircraft defense systems, Airborne, Shipborne, USSR.

Contents: (1) A brief history of the origin and development of military radio communications; (2) General concepts of radio communications and a brief outline of radio engineering; (3) Properties of radio waves and the nature of their propagation; (4) Role of radio communication in modern combat; (5) Military radio communications; (6) Radio communications facilities and radio navigation of aviation; (7) Means of radio communications of the navy; (8) Application of television in military affairs; (9) A short history of the development of radar in the USSR; (10) Physical bases of radar; (11) Infrared technology; (12) Radar facilities for antiaircraft defense; (13) Radar and infrared facilities of the navy; (14) Radar armament of the air force; (15) Radar and infrared facilities of land forces; (16) Equipment for radar target identification; (17) Meteorological radar stations; (18) Facilities for combating radar.

AD-614 214 Div. 5, 12

Lincoln Lab., Mass. Inst. of Tech., Lexington.
LONG RANGE COMMUNICATION BY ORBITING DIPOLE BELTS,
by Walter E. Morrow, Jr. 1963, 13p MS-923
Contract AF19 628 500

Unclassified report

Pub. in mono. Progress in Radio Science 1960-1963, Vol. VIII, Space Radio Science, Amsterdam, 1965, p224-35 (Copies available only to DDC users).

Descriptors: (*Communication satellites (Passive), Dipole antennas), (*Foils, Communication satellites (Passive)), (*Dipole antennas, Communication satellites (Passive)), (*Global communication systems, Communication satellites (Passive)), Radio communication systems, Microwave frequency, Orbital trajectories, Communication theory.

This paper is a brief report of the result obtained from the launching of 20 kg of 8000 Mc/s dipoles, in May of 1963 into a 3000 km altitude polar orbit. The dipoles were released from a spinning dispenser which employed the sublimation of a naphtalene binder to release the dipoles. Preliminary radar measurements indicate that the belt formation, thickness, and orbital perturbations were close to those predicted theoretically. The belt lifetime is expected to be less than five years as the result of solar radiation pressure effects. Bistatic propagation and communication experiments were carried out between the west and east coast of the U. S. The results of these experiments were close to theoretical predictions. (Author)

AD-614 336 Div. 5

Bolt, Beranek and Newman, Inc., Cambridge, Mass.
ARTICULATION-TESTING METHODS: CONSONANTAL DIFFERENTIATION WITH A CLOSED-RESPONSE SET,
by Arthur S. House, Carl E. Williams, Michael H. L. Hecker, and K. D. Kryter. 20 Jul 64, 11p
Contract AF19 628 382, Proj. 2808, Task 280801
ESD TDR-64-507

Unclassified report

Pub. in The Journal of Acoustical Society of America v37 nl p158-66 Jan 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Speech, Intelligibility), (*Speech recognition, Voice communication systems), Speech transmission, Speech representation, Signal-to-noise ratio, Hearing, Air force personnel, Tests, Statistical analysis, Reliability.

The development and evaluation of a new speech-intelligibility test suitable for routine use by operational personnel in determining the performance level of speech-communication systems is described. The format used is similar to that described for a rhyme test but makes use of a closed-response set. An experiment was performed to determine the general reliability of the test materials when administered to U. S. Air Force enlisted personnel under a wide range of signal-to-noise ratios. Testing of 18 listeners over a period of 30 days showed that repeated exposure to the materials did not change the levels of average response in any appreciable

way. Analysis of the responses to individual phonetic elements shows that the test can be useful for diagnostic study as well as for over-all evaluation of communication systems. Talker differences that appeared during the experiment and the statistical reliability and sensitivity of the materials are analyzed and discussed. (Author)

AD-614 416 Div. 5
CFSTI Prices: HC$5.00 MF$1.00

RAND Corp., Santa Monica, Calif.
IMPULSE NOISE AND ERROR PERFORMANCE IN DATA TRANSMISSION,
by P. Mertz. Apr 65, 173p Rept. no. RM-4526-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Telephone communication systems, Data transmission systems), (*Data transmission systems, Noise), Telephone transmitters, Statistical distributions, Interference, Probability, Mathematical models, Performance (Engineering), Errors, Frequency, Statistical analysis.

The report summarizes study of statistical parameters that can describe the amplitude and occurrence of impulse noise, and the occurrence of errors, on a data transmission facility. It was found that the phenomena do not follow the conventional statistics of purely random events. Instead they can be described by equations of a hyperbola, of the first or higher or lower orders. There is some indication the distributions change, between those valid for short periods of under a few hours, and those for longer periods of from a few hours up to a number of months. The study included examination of the probability of 'error chains' of extended duration which results from the hyperbolic laws. This turns out to be much more than the insignificant probability indicated by classical laws, and is in general agreement with experimental observations. Precautions are indicated for the measurement of error performance. (Author)

6. Detection

AD-614 013 Div. 6, 25, 26

Lansdale Div., Philco Corp., Pa.
PROCESS SPECIFICATIONS AND TEST PROCEDURES: ADDENDUM TO PEM FOR GOLD-DOPED GERMANIUM INFRARED DETECTOR TYPE IR400.
Quarterly progress rept. no. 8, add., 1 Oct-31 Dec 64.
31 Dec 64, 63p
Contract DA36 039AMC0146E, Proj. H200
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.
See also AD-609 028.

Descriptors: (*Infrared detectors, Manufacturing methods), (*Germanium, Infrared detectors), Gold, Impurities, Specifications, Test methods, Processing, Quality control.

AD-614 048 Div. 6, 8
CFSTI Prices: HC$4.00 MF$0.75

Bendix Field Engineering Corp., Owings Mills, Md.
ERROR ANALYSIS OF RADAR SET AN/MPN-13.
Final rept.
Mar 65, 109p
Contract AF30 602 2975, Proj. 4557, Task 455701
RADC TDR-64-489
Unclassified report

Descriptors: (*Radar equipment, Performance (Engineering), (*Radiofrequency interference, Search radar), (*Errors, Search radar), Statistical analysis, Performance (Human), Measurement.

The report, which presents the results of the Error Analysis Study made in conjunction with the Spectrum Signature Measurements on Radar Set AN/MPN-13, is composed of four sections. The Error Analysis Study was performed on only two (2) of the Spectrum Signature Measurements performed on the AN/MPN-13, Transmitter Spurious Emission and Receiver Spurious Response. Section 1 presents the general test information. Section 2 discusses the technical approach taken during the Error Analysis Study and Section 3 presents a summary of the results.and conclusions. Section 4 details the measurements performed and presents all data obtained during the Error Analysis Study. (Author)

AD-614 414 Div. 6, 12, 15
CFSTI Prices: HC$3.00 MF$0.75

RAND Corp., Santa Monica, Calif.
A STATISTICAL ANALYSIS OF PHASE ERRORS AND PHASE DIFFERENCE ERRORS DUE TO THE ATMOSPHERE IN THE OBSERVATIONS OF THE RADAR RETURN FROM A SATELLITE,
by Marvin Blum. Apr 65, 80p Rept. no. P-3115
Unclassified report

Study carried out by Conductron Corp., Ann Arbor, Mich., under Lockheed Prime Contract AF04 695 250. Rept. prepared for presentation at the Spring Meeting of the International Scientific Radio Union, National Academy of Sciences, Washington, D. C., 20-24 Apr 65.

Descriptors: (*Atmospheric refraction, Radar signals), (*Radar signals, Atmospheric refraction), (*Phase measurement, Radar signals), Troposphere, Propagation, Ionospheric propagation, Wave transmission, Optimization, Satellites (Artificial), Stochastic processes, Mathematical models, Errors, Phase distortion.

A summary of the statistical properties of the ionosphere and troposphere is presented. A mathematical model is developed to compute the phase errors due to the atmosphere. The phase errors are divided into random errors and residual bias errors. The residual bias error is the unknown component of phase error left after theoretical corrections based on measurements during satellite passage of surface index of refraction and ionospheric profile parameters. The total mean square phase difference is computed as the sum of four components.

AD-614 477 Div. 6
CFSTI Prices: HC$1.00 MF$0.50

Mitre Corp., Bedford, Mass.
AN EFFICIENCY FUNCTION FOR RATING MECHANICAL SCAN-TRACK RADARS,
by James W. McGinn, Jr. Mar 65, 22p
Rept. no. W-07109/0000/00/0/00
Contract AF19 628 2390, Proj. 496L
ESD TR-65-80
Unclassified report

Descriptors: (*Space surveillance systems, Radar equipment), (*Radar scanning, Effectiveness), (*Radar tracking, Effectiveness), Target acquisition, Guided missiles, Satellites (Artificial), Functions, Mathematical analysis, Air Force.

A function, (P sub d), introduced in ESD-TDR-63-292, is derived as a measure of effectiveness in rating certain mechanical scan-track radar configurations in the joint performance two operational requirements. These are: (1) confirmation, i.e., acquisition and tracking of objects (missiles and/or satellites) detected by collocated surveillance radars, and (2) scanning, i.e., providing additional surveillance coverage for a missile threat in a sector not searched by the collocated surveillance radars. We are mainly interested in the application of the P sub d function to the problems of selecting a radar for BMEWS Site II service. It is thought, however, that the function would be of general interest to others with similar problems of selection under joint operating constraints. (Author)

7. Electrical Equipment

AD-613 959 Div. 7, 8, 20
CFSTI Prices: HC$6.00 MF$1.50

Radio Corp. of America, Moorestown, N. J. Missile and Surface Radar Div.
DESIGN OF A HIGH-ENERGY FAST-PULSE POWER SYSTEM, PHASE II.
Rept. for Jun 63-Jun 64,
by C. A. Nittrouer. Mar 65, 249p
Contract AF29 601 6035, Proj. 5776, Task 577601
WL TDR-64-94

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Power supplies, Design), Capacitors, Coaxial cables, Data transmission systems, Electric discharges, Electric fields, Electronic equipment, Exploding wires, Pulse generators, Transducers, Waveform generators, Pressure, Nuclear explosions, Simulation, High altitude.

The work involves a three-part (analytical, experimental and design) program for development of a High-Energy, Fast-Pulse Power System to be used for simulation of certain aspects of high-altitude, nuclear detonations. The program was undertaken with objectives of (1) design and cost estimates of the system, and (2) analytical and experimental studies to answer certain remaining questions regarding operation of such a system. It has resulted in a recommended design for a practical system and has provided certain results and conclusions from the experimental and theoretical studies. These findings indicate that such a system can be constructed and have shown what may be expected in regard to output radiation dose rates relative to discharge of the system stored electrical energy. (Author)

AD-614 058 Div. 7, 4
CFSTI Prices: HC$1.00 MF$0.50

Naval Research Lab., Washington, D. C.
OXIDES ON THE SILVER ELECTRODE. PART 2. X-RAY DIFFRACTION STUDIES OF THE WORKING SILVER ELECTRODE.
Final rept.,
by Jeanne Burbank and C. P. Wales. 22 Oct 64, 13p
Rept. no. NRL-6171
Projs. SF013 06 03, RR001 01 43 4755, Task 4366

Unclassified report

Descriptors: (*Silver, Electrodes), (*Electrodes, Chemical reactions), Silver compounds, Oxides, X-ray diffraction analysis, Electrochemistry, Crystal lattices, Oxidation, Reduction (Chemistry), Electrolytic cells, Electric currents, Electrolysis, Alkaline cells, Zinc, Cadmium, Batteries and components, Storage batteries.

Silver electrodes were examined in 20-50% KOH using a cell permitting simultaneous x-ray diffraction and electrochemical studies. Highly oriented smooth rolled sheet silver developed randomly oriented Ag on its surface during early cycles. Charge-discharge capacity increased to a maximum as surface area increased. AgO crystal size and amount formed varied inversely with charging current density with high charging rates giving tight coatings of small AgO crystals that limited further oxidation. Reactions took place initially at the outer surface of the electrode with oxidation to Ag2O and AgO and reduction to Ag2O and Ag occurring by formation of distinct crystals rather than by expansion or contraction of preexisting crystal lattices. Discharge capacity at the AgO/Ag2O potential plateau depended more on surface area than on quantity of AgO. A slow discharge produced smoother Ag surfaces, lowering capacity of the next cycle. There was never evidence of a suboxide, oxidation state higher than AgO, solid solution, or alloy of oxygen and silver. (Author)

AD-614 104 Div. 7, 4
CFSTI Prices: HC$1.00 MF$0.50

Army Electronics Command, Fort Monmouth, N. J.
THE EFFECT OF CARBONATED ELECTROLYTE ON THE PERFORMANCE OF SINTERED PLATE NICKEL-CADMIUM CELLS,
by Paul J. Rappaport. Feb 65, 15p
Technical rept. no. ECOM-2559
Proj. 1C014501A34A, Tasks 1C014501A34A00, 1C014501A34A02

Unclassified report

Descriptors: (*Alkaline cells, Performance (Engineering)), (*Electrolytes, Carbonates), (*Carbonates, Alkaline cells), Potassium compounds, Hydroxides, Resistance (Electrical), Electrodes, Nickel, Cadmium.

The effect on the capacities of positive and negative limiting sintered plate Ni-Cd cells of varying the KOH/K2CO3 ratio of an electrolyte which is approximately 7N in total alkalinity is reported. K2CO3 contents of 24, 71 and 238 g/1 were investigated; Data are also presented on the specific resistance of various KOH-K2CO3 solutions over the temperature range of 86F. to -40F. There was no marked difference in performance of either positive or negative capacity limiting cells with electrolyte containing 24 or 71 g/1 of K2CO3. However, there was an appreciable adverse effect on the performance of cells when the carbonate content was 238 g/1 K2CO3, particularly for the negative capacity limiting cells. From the results of the capacity and specific resistance measurements, it is recommended that the maximum allowable carbonate content for the electrolyte in sintered plate Ni-Cd cells be set at 100 g/1 K2CO3. (Author)

AD-614 119 Div. 7, 4
CFSTI Prices: HC$3.00 MF$0.50

Delco-Remy Div., General Motors Corp., Anderson, Ind.
ZINC ELECTRODE INVESTIGATION.
Quarterly technical progress rept. no. 3, 1 Jan-1 Apr 65,
by J. J. Lander, J. A. Keralla, and R. S. Bogner. 15 Apr 65, 51p
Contract AF33 615 1583, Proj. 8173, Task 817304, 817301

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC.
Copy is available for public sale.
See also AD-609 984.

Descriptors: (*Storage batteries, Electrodes), (*Electrodes, Zinc), (*Zinc, Electrodes), Life expectancy, Silver compounds, Oxides, Hydrogen, Oxygen, Recombination reactions, Surface active substances, Containers, Plastics, Crystals, Surface properties, Silver.

Auxiliary electrodes attached to AgO electrodes through a diode in a test cell appear to eliminate

excessive pressures occurring through H2 liberation. The use of acicular (needle-like) particle shapes of zinc-oxide are detrimental to cycle life. The zinc-oxide KADOX-15 appears to be most satisfactory for use in cells in this program. The repeat tests on surfactants using 1%, 3%, 5% additions in the negative material indicate that additions larger than 1% are detrimental to cell performance. A new cell case and cover mold is completed, and test units of Celcon moldings are being prepared for heat sealing techniques. (Author)

AD-614 329 Div. 7, 4

Army Electronics Labs., Fort Monmouth, N. J.
FUEL CELL ELECTRODES FOR ACID MEDIA,
by Walter G. Taschek. 17 Feb 64, 9p
Unclassified report

Pub. in Advances in Chemistry Series n47 p9-17 1965.
Copies not available to DDC or Clearinghouse customers.

Descriptors: (*Fuel cells, Electrodes), (*Electrodes, Fuel cells), Inorganic acids, Anodes (Electrolytic cell), Cathodes (Electrolytic cell), Corrosion, Moistureproofing, Aliphatic compounds, Waxes, Catalysis, Platinum compounds, Dibasic acids, Chlorides, Electrolytes, Electrodeposition, Halocarbon plastics, Carbon, Hydrogen, Oxygen, Life expectancy, Polarization, Electrochemistry.

Investigations were conducted toward developing high drain fuel cell electrodes for acid media. Activated carbon electrodes were prepared, wetproofed with paraffin or Teflon, and catalyzed with platinum. The wetproofing agent was applied by immersion or electrodeposition and the catalyst applied by chemical decomposition of H2P+C16 solutions. Half cell studies with hydrogen anodes and oxygen (air) cathodes showed that electrochemical performance is essentially the same for paraffin and Teflon-treated electrodes; however, the life of the Teflon-treated electrodes under equal conditions of load is greater than that for paraffin-treated electrodes. An equation that describes the cathode's polarization behavior for heterogeneous porous electrodes expresses a simple relationship between current density and polarization and is valid in the range of practical current densities. (Author)

AD-614 388 Div. 7
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
CURRENT FROM ALCOHOL,
by K. Schwabe. 1 Apr 65, 14p FTD-TT-64-1057
TT 65-62064 Unclassified report

Unedited rough draft trans. of Urania-Wissen und Leben (East Germany) v26 n12 p997-1002 1963.
Available copy will not permit fully legible reproduction.
Reproduction will be made if requested by users of DDC.
Copy is available for public sale.

Descriptors: (*Alcohols, Fuel cells), (*Electric power production, Fuel cells), (*Fuel cells, Electric power production), Energy conversion, Electrodes, Electrochemistry, East Germany, Electrolytes.

AD-614 471 Div. 7, 4
CFSTI Prices: HC$3.00 MF$0.75

Melpar, Inc., Falls Church, Va.
A THIN-PLATE BATTERY. SUPPLEMENT TO THIN-FILM MONOTRONICS.
Final rept., suppl., 12 Mar 64-12 Mar 65,
by J. Smit. 12 Mar 65, 62p
Contract NOw64 0568d
Unclassified report

See also AD-607 029.

Descriptors: (*Batteries and components, Primary cells), (*Power supplies, Primary cells), Performance (Engineering), Wet cells, Ammonia, Electrolytes, Salts, Anhydrides, Compatibility, Aluminum, Polymers, Containers, Electrodes, Electrochemistry.

Data obtained thus far point to the feasibility of producing a high power output liquid ammonia-activated battery. Experimental results show the capability of the system to operate at both high and low current densities and through a wide range of temperatures. In addition it has been demonstrated to a reasonable extent that the data generated in small units can be gainfully extrapolated to the construction of larger units capable of producing power outputs up to 75 watts. There remain however, some materials and engineering problems yet to be solved before a practical high power output unit can be produced. Specifically, there exists a need for a battery plate compartment liner material that is chemically resistant and easy to handle. Also, a reservoir compartment liner compatible with the electrolytic solution over long periods of storage is needed. Another engineering difficulty is designing a lightweight case capable of containing internal pressures generated during battery discharge. Any increase in pressure over the equilibrium vapor pressure of the electrolytic solution or the drive gas pressure necessitates a case structure of unreasonable size and weight. Though internal structural supports minimize battery case size and do not adversely affect the battery performance (while permitting the use of thin chamber end plates), they do complicate the battery fabrication procedures. (Author)

8. Electronics and Electronic Equipment

AD-613 919 Div. 8, 15

Microwave Research Inst., Polytechnic Inst. of Brooklyn, N. Y.
SINGULAR NETWORK ELEMENTS.
Revised ed.,
by Herbert J. Carlin. 14 Aug 63, 6p
Contract AF30 602 2868; Grant AF AFOSR62 280
AFOSR 65-0621
Unclassified report

Pub. in I E E E Transactions on Circuit Theory (U. S.) vCT11 n1 p67-72 Mar 1964 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 14 Jun 63.

Descriptors: (*Electrical networks, Matrix algebra), (*Circuits, Theory), Networks, Gates (Circuits), S-matrix.

The properties of n-ports is examined in terms of simple properties of linear vector spaces. This approach leads to a very general type of network formalism which in turn casts light on the physical realizability (or nonrealizability) of the singular linear network elements: the nullator (simultaneously an open and a short circuit), and the norator (the unique nonreciprocal one-port with arbitrary port voltage and current). Furthermore, a two-port (the 'nullor') which combines these two elements is shown to be a unique active building block which exhibits the extraordinary nature of the two singular one-ports, but which has other properties which make it amenable for use in practical systems. (Author)

AD-613 932 Div. 8
CFSTI Prices: HC$3.00 MF$0.75

Radiation, Inc., Melbourne, Fla.
STUDY OF SPECIAL BEAMSHAPING ANTENNAS.
Quarterly rept. no. 1, 1 Oct-31 Dec 64,
by H. E. Bartlett, B. L. Lewis, L. Pietsch, and G. W. Collins. 31 Dec 64, 80p Rept. no. R-5
Contract DA28 043AMC00389S, Proj. 1R3 32 101D253
Unclassified report

Continuation of contract DA36 039AMC03310E
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.
See also AD-607 321.

Descriptors: (*Antennas, Space communication systems), (*Dielectrics, Antennas), Antenna configurations, Parabolic antennas, Antenna radiation patterns, Antenna feeds, Inflatable structures, Discs, Styrene plastics, Expanded plastics, Weight, Portable, Cylindrical bodies, Reflectors, Communication satellites (Active).

The report describes the progress made on a program to develop dielectric elements for use in lightweight, highly-transportable satellite communications antennas. The dielectric element investigations indicate that several types of dielectric elements are applicable. These elements are projected into possible array configurations which are evaluated and compared on the basis of transportability. At present, three dielectric antenna types are being considered as possible elements for use in the array model. They are: (1) The cylindrical dielectric antenna, (2) The lens-corrected tapered dielectric antenna, and (3) The dielectric/reflector antenna. Projected configurations of highly-transportable satellite communications antenna using these elements promise unique transportability features.

AD-613 947 Div. 8
CFSTI Prices: HC$1.00 MF$0.50

David Taylor Model Basin, Washington, D. C.
ON THE DESIGN OF A RESISTANCE-CAPACITANCE FILTER FOR USE AT VERY LOW FREQUENCIES,
by W. S. Campbell. Mar 59, 24p
Research and Development rept. no. 1307
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Electric filters, Very low frequency), Voltage, Feedback, Resistance (Electrical), Capacitance, Inductance, Electrical networks, Circuits, Band-pass filters, Low-pass filters, High-pass filters, Functions, Simulation, Design.

The development of a resistance-capacitance filter for use at extremely low frequencies is discussed. It is shown that, by application of voltage feedback, the characteristic response of a properly terminated L-C constant-K filter can be simulated. (Author)

AD-613 948 Div. 8
CFSTI Prices: HC$1.00 MF$0.50

David Taylor Model Basin, Washington, D. C.
THE DTMB TYPE 337-1A ELECTRONIC LOW-PASS FILTER INSTRUCTION MANUAL,
by F. E. Frillman. Dec 59, 22p
Research and Development rept. no. 1377
Unclassified report

Descriptors: (*Low-pass filters, Instruction manuals), Design, Operation, Maintenance, Resistance (Electrical), Capacitance, Feedback, Electrical impedance, Electric networks, Circuits, Performance (Engineering).

A four-channel low-pass filter unit is described, with emphasis on operating and maintenance procedures for the instrument. Each channel has provisions for nominal cutoff frequencies of 80, 40, 20 and 10 cps. An active R-C feedback circuit is used which permits easy modifications for operation at much lower frequencies without deterioration of performance. (Author)

AD-613 951 Div. 8, 25
CFSTI Prices: HC$6.00 MF$1.50

Research Triangle Inst., Durham, N. C.
INTEGRATED SILICON DEVICE TECHNOLOGY. VOLUME VI. UNIPOLAR TRANSISTORS.
Rept. for Jun-Dec 64,
by J. R. Hauser. Mar 65, 254p
Contract AF33 615 1998, Proj. 4159, Task 415906
ASD TDR-63-316 v6
Unclassified report

See also AD-408 961, -423 148, -603 715, -603 716, and -605 558.

Descriptors: (*Semiconductor devices, Silicon), (*Transistors, Integrated circuits), (*Integrated circuits, Transistors), Switching circuits, Computer logic, Computer storage devices, Topology, Surfaces, Theory, Design, Direct alternating, Alternating current.

This report discusses the theory and design parameters for unipolar (field effect) transistors in integrated circuits. The work is divided into four major sections. The first two major sections discuss the theory and characteristics of junction and surface (MOS) unipolar transistors. A detailed discussion is given of both the dc and small signal

ac characteristics. The next section discusses design considerations for unipolar transistors in integrated circuits. This includes discussions of isolation problems, topological design, and compatibility of integrated unipolar transistors with other circuit components. Design examples are given of unipolar transistors for integrated circuits. The last major section discusses some possible circuit applications of unipolar transistors. (Author)

AD-613 953 Div. 8
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., Schenectady, N. Y.
ULTRA HIGH POWER TRANSMISSION LINE TECHNIQUES.
Quarterly rept. no. 6, 1 Jul-30 Sep 64,
by John P. Quine. Mar 65, 65p
Contract AF30 602 2990, Proj. 5573, Task 557301
RADC TR-65-7

Unclassified report

Descriptors: (*Waveguides, Design), (*Transmission lines, Waveguides), Feasibility studies, Configuration, Miniature electronic equipment, Power.

The purpose of this investigation is to develop systematic procedures for selecting optimum waveguide configurations and designing waveguide components that will operate at high levels of peak and average power in the frequency range 1-10 gigacycles. In particular, the feasibility will be investigated of designing compact components such as bends, couplers, power dividers, tapers, and mode absorbers in waveguides having cross section dimensions in the range 1.5 to 2.5 free space wavelengths. In the present report the analysis of multihole side wall couplers is continued. Theoretical data are presented for constant curvature E-plane bends. The results of mode conversion measurements are presented for a 40 in straight taper, a 24 in. variable curvature taper, and a full oversized H-plane bend having R/a equal to 1.48. The results of a study of mode conversion at waveguide flanges is also presented. (Author)

AD-613 960 Div. 8, 30
CFSTI Prices: HC$5.00 MF$1.25

Radio Corp. of America, Burlington, Mass. Aerospace Systems Div.
COMPUTER ALGORITHM FOR FAULT ISOLATION AND TEST POINT SELECTION.
Rept. for 15 Feb-5 Dec 64,
by S. M. Fisch and G. R. Brigida. 1964, 185p
Contract AF33 615 1347, Proj. 8119, Task 811927
APL TR-65-12

Unclassified report

Descriptors: (*Test equipment (Electronics), Programming (Computers)), (*Programming (Computers), Test equipment (Electronics)), (*Checkout procedures, Programming (Computers)), (*Electrical engineering, Programming (Computers)), Analog systems, Circuits, Failure (Mechanics), Malfunctions, Test methods, Computers, Data processing systems.

This report presents the methods and results of a study to develop a computer algorithm for automatically selecting test point locations in an electronic circuit, for generating test measurements, and for designing a corresponding test procedure. The algorithm is oriented towards analog circuits where piece-part fault isolations are made using sequential tests which can be performed either manually or on tape-controlled automatic test equipment. The algorithm was tested by introducing faults into the test circuit and then tests were made in accordance with the computer generated test procedure. The correct faults were selected and no false indications were present. The output from the computer program includes (1) a specification of necessary testpoint locations and (2) a sequential test procedure including measured nominal values and test limits under both good and faulty circuit conditions. (Author)

AD-613 994 Div. 8
CFSTI Prices: HC$2.00 MF$0.50

S F D Labs., Inc., Union, N. J.
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
Quarterly progress rept. no. 6, 1 Mar-1 Jun 64,
by H. L. McDowell. Jul 64, 36p
Contract AF30 602 2533, ARPA Order 136 61
RADC TR-65-79

Unclassified report

See also AD-426 729.

Descriptors: (*Microwave amplifiers, L band), (*Electron tubes, Microwave amplifiers), (*Crossed field devices, Microwave amplifiers), Reliability (Electronics), Feasibility studies, Magnetic fields, Electron tube parts, Electrodes.

Life tests were continued on the Group C SFD-209 tubes. 4411 hours have been accumulated. Tubes L48E and L1E have operated 2150 and 1288 hours, respectively. L1E was damaged by an equipment failure and has been removed from life test for study. Degradation of performance was discontinouous and corresponded to equipment failure. To prevent future failures, the external circuitry has been improved and the final tubes modified. Tube L30E was used in an experiment designed to investigate the improvement of efficiency through improved confinement of electrons to the interaction space. A barreling magnetic field was used to improve magnetic confinement but no significant change in efficiency was observed. Further tests indicate that V-I characteristics will be quite reproducible from tube to tube. The sources of variations previously noted have been traced down and found to be external to the tube. The control electrode support and the input window have been redesigned. An attempt will also be made to incorporate preferential pi mode damping, by means of an absorber located behind the C13 couplers. (Author)

AD-613 995 Div. 8
CFSTI Prices: HC$2.00 MF$0.50

S F D Labs., Inc., Union, N. J.
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
Quarterly progress rept. no. 7, Jun-Sep 64,
by H. L. McDowell and A. Wilczek. Oct 64, 34p
Contract AF30 602 2533, ARPA Order 136 61
RADC TR-65-82

Unclassified report

See also AD-613 994.

Descriptors: (*Microwave amplifiers, L band), (*Electron tubes, Microwave amplifiers), (*Crossed field devices, Microwave amplifiers), Reliability (Electronics), Electrodes, Electron tube parts, Cooling, Phase distortion, Secondary emission.

Life tests were continued on the Group C, SFD-209 tubes. Tubes L30E, D37F, and L48E are operating in parallel from a common RF source and dc power supply. A total of 8349 hours of operation was accumulated. Apparent degradation of performance was traced to external circuit faults. With circuit faults corrected, tube L48E had no significant change in

performance after 3268 hours of operation. Tubes L30E and D37F are operating satisfactorily after 748 and 769 hours, respectively. Group D tubes were constructed, and incorporate improved control electrode cooling and a new input window. Tubes F63F and G35F of the new Group D design were tested and found to be satisfactory. Tube G35F was used to observe the effects of increased anode-cathode separation which allows operation in the region of lower power output, where under conditions of less separation, the output would contain some pi mode oscillations. Starting delay in tube G35F was also studied. Starting delay times of less than 20 nanoseconds were observed for a 5 kw peak input over a 1000 volt range of cathode voltage encompassing the normal operating values. (Author)

AD-613 999 Div. 8, 30
CFSTI Prices: HC$1.00 MF$0.50

Texas Instruments, Inc., Dallas.
MICROELECTRONIC FREQUENCY AND TIME STANDARD.
Quarterly progress rept. no. 3, 1 Jan-1 Apr 65.
15 Apr 65, 23p Rept. no. U3-807240-3
Contract NObsr91352, Proj. SR0080303, Task 9624
Unclassified report

See also AD-610 503.

Descriptors: (*Subminiature electronic equipment, Time-interval counters), (*Frequency, Standards), (*Semiconductor devices, Frequency stabilizers), Timing devices, Crystal oscillators, Circuits, Power supplies, Amplifiers, Design.

Progress during the reporting period continued to be slower than desired. Technical difficulties developed in three areas which delayed the completion of the design phase. A critical problem still exists with the CR-71/U crystals. The crystal manufacturer has not been able to supply a crystal to meet MIL-C-3098/49. In addition, the receipt of linear SCN's from the vendor was delayed to 31 March and the digital SCN's have been delayed to 1 May. This has delayed the testing and evaluation of some designs and delayed the schedule for the beginning of assembly of the equipment. The design phase was completed, however, and fabrication has begun. A prototype frequency standard has been built and will be displayed at the Third Annual Microelectronic Symposium in Monterey, California on 5, 6 and 7 April. A prototype amplifier module from the Distribution Amplifier will also be displayed at the symposium. (Author)

AD-614 000 Div. 8, 25
CFSTI Prices: HC$2.00 MF$0.50

Shockly Transistor Div., Clevite Transistor, Palo Alto, Calif.
NEW CONCEPTS FOR SOLID STATE MICROWAVE GENERATORS.
Quarterly rept. no. 7, 1 Jul-31 Oct 64,
by R. M. Scarlett. 31 Oct 64, 38p
Contract DA36 039AMC00001E, Proj. 1P6 22001A056
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.
See also AD-602 093.

Descriptors: (*Microwave equipment, Semiconductors), (*Transistors, Preparation), (*Avalanche diodes, Preparation), Silicon compounds, Dioxides, Oxidation, Semiconducting films, Impurities, Diboranes, Phosphorus compounds, Oxides, Nitrides, Diffusion, Epitaxial growth, Electrodeposition.

An extensive series of experimental surface controlled avalanche transistor (SCAT) devices, all basically planar structures, have been made. Different substrate (drain) resistivities, different source diffusion schedules, and different means of producing the thin oxide under the gate region were investigated. Two geometries were used, a circular and a stripe configuration. Although few consistent results were achieved, it appeared that the best oxide of those investigated was produced by thermal oxidation in dry oxygen at 1100C. By observing light emission, it was found that the operation was probably quite nonuniform, accounting for the transconductance being less than calculated. Two types of drift in the characteristics were noted, one reversible upon reversing gate to source voltage, and the other apparently irreversible. The first was traced to ion motion on the oxide surface, but the second is not yet understood. (Author)

AD-614 001 Div. 8
CFSTI Prices: HC$2.00 MF$0.50

Eitel-McCullough, Inc., San Carlos, Calif.
HIGH POWER X-BAND GENERATOR.
Quarterly rept. no. 9, 1 Oct-31 Dec 64,
by William R. Luebke and Tore Wessel-Berg.
1 Mar 65, 35p
Contract AF30 602 2756, Proj. 5573, Task 557303
RADC TDR-65-96
Unclassified report

See also AD-612 911.

Descriptors: (*Microwave amplifiers, X-band), (*Klystrons, Microwave amplifiers), Waveguides, Electron tubes, Power amplifiers, Radar transmitters, Waveguide windows, Circuits, Performance (Engineering).

The purpose of this program is to develop a klystron amplifier operating at 8 kMc and delivering one megawatt of CW power. The first of the multi-output tubes was tested CW. Waterload arcing hampered the testing but 500 kilowatts was observed for a brief period and operation at 350-400 kilowatts was resonably stable. Subsequently the tube was lost when an arc detector failed to fire and a window cracked. Further tube testing could not be accomplished owing to failure of the main high-voltage transformer which was not repaired at quarter's end. Further analysis of power flow in extended-interaction cavities is presented. (Author)

AD-614 027 Div. 8
CFSTI Prices: HC$2.00 MF$0.50

Army Electronics Command, Fort Monmouth, N. J.
TUNABLE PRESELECTION THROUGH PARAMETRIC CONVERSION,
by Joseph M. Giannotto and Eugene J. Chabak.
Nov 64, 48p Technical rept. no. ECOM-2510
Proj. 1P6 22001A057, Tasks 1P6 22001A057 05, 1P6 22001A057 09
Unclassified report

Descriptors: (*Radio receivers, Parametric amplifiers), (*Parametric amplifiers, Radio receivers), Radio interference, Filters (Electromagnetic wave), Varactor diodes, Mixers (Electronics), Linear systems, Tuned circuits, Amplifiers, Pumping (Electronics), Band-pass filters, Narrowband, High frequency, Noise (Radio), Modulation, Design.

One of the most damaging deficiencies in present RF receiver design is vulnerability to overloading caused by strong out-of-band signals which can partially or completely disrupt communications. The emergence of the parametric amplifier has provided the design

engineer with a frequency converter which is considerably more amplitude-linear than conventional devices, with the added feature of low noise characteristics. The attenuation of strong out-of-band signals is accomplished by the use of a high Q fixed frequency filter following the parametric converter. With this approach a dynamic range of 140 db has been achieved, an improvement of 55 to 60 db over well designed conventional receivers. The report presents comprehensive performance characteristics of a tunable parametric preselector which was developed to operate over the frequency range of 2 to 32 megacycles. Also presented is a discussion of the ramifications of selecting the specific circuitry and parts. (Author)

AD-614 035 Div. 8, 30
CFSTI Prices: HC$7.00 MF$1.75

Department of Defense, Washington, D. C.
PROPERTIES OF STRIP TRANSMISSION LINE, VOLUME I,
by Arthur D. Sills. Oct 64, 311p
Unclassified report

Volume I of 2 volumes.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.
See also AD-614 036.

Descriptors: (*Transmission lines, Design), (*Microwave equipment, Design), Electrical impedance, Microwave frequency, Coaxial cables, Attenuation, Dielectric properties, Computers, Theory, Capacitance, Transients.

Stripline components for high speed logic are compared to their equivalent waveguide components with respect to size and cost. Impedance measurements in Stripline at microwave frequencies require the use of a slotted line. Since commercial coaxial slotted lines are readily available and a Stripline laboratory model would be expensive and time consuming to produce, it was decided that the coaxial slotted line with its attendant transition was the best approach. It is in this transition that the problem arises. The junction introduces a discontinuity which must be taken into account. By making the rather good approximation that the junction is lossless, a bilinear transformation may be used to relate the two sides of the junction. A theoretical derivation is made and an example worked to illustrate the practical aspects of the solution. It was found that, while this method cannot be used to find the characteristic impedance of Stripline, if the characteristic impedance is known, the impedance of any unknown Stripline load can be found. Experimental verification of Stripline attenuation is shown using a Stripline Spiral. Good correlation is obtained between measured and theoretical values of attenuation up to 3.5 Kmc. A transfer function for Stripline is found using standard transmission line formulation. This transfer function is broken into two parts, dielectric response and skin effect response. A set of curves is given for dielectric response.

AD-614 036 Div. 8, 30
CFSTI Prices: HC$6.00 MF$1.50

Department of Defense, Washington, D. C.
PROPERTIES OF STRIP TRANSMISSION LINE, VOLUME II,
by Arthur D. Sills. Oct 64, 259p
Unclassified report

Volume II of 2 volumes.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.
See also AD-614 035.

Descriptors: (*Transmission lines, Design), (*Microwave equipment, Design), Bandwidth, Voltage, Electric connectors, Waveguides, Propagation.

Contents:
Chapter 6. Q and bandwidth of Stripline
Chapter 7. Stripline coupling
Chapter 8. Stripline discontinuities
Chapter 9. Higher mode propagation in Stripline
Chapter 10. Power capacity of Stripline.

AD-614 045 Div. 8
CFSTI Prices: HC$5.00 MF$1.00

Microwave Lab., Stanford Univ., Calif.
STUDY OF PARALLEL PUMPING IN MICROWAVE FERRITES.
Technical rept.,
by M. Omori. Dec 64, 171p Rept. no. ML-1275
Contract Nonr22548, Proj. NR373 361
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Ferrites, Magnetic resonance), (*Microwave equipment, Ferrites), (*Pumping (Electronics), Ferrites), Oscillators, Ferromagnetism, Circuits, Theory, Experimental data.

The purpose of this study was to investigate the degenerate parallel pumping of the ferromagnetic resonance in microwave ferrites. The investigation is divided mainly into two categories; one, the investigation for the pump strength below the instability threshold, and the other above the threshold. Because nonlinearities of the system are not important for the first case, the linearized equation is used for the derivation of the transverse susceptibility under the parallel pump condition. It was found from the analysis that the effective transverse linewidth under the degenerate parallel pump condition is a function of the pump strength and that the effective transverse susceptibility is a function of the pump strength as well as a function of the phase angle between the parallel pump field and the transverse driving field. When the phase angle is chosen for pumping the system (at special angles, the system is depumped instead of pumped) the effective susceptibility becomes infinite at the threshold of the parallel field. When the parallel field strength is above the threshold, the effective susceptibility becomes negative and hence the system becomes unstable.

AD-614 046 Div. 8
CFSTI Prices: HC$1.00 MF$0.50

Radiation Lab., Univ. of Michigan, Ann Arbor.
DIFFRACTION AND SCATTERING BY REGULAR BODIES.
Final rept. for Feb 60-Jan 65,
by R. E. Kleinman. Feb 65, 22p Rept. no. 3648-1-F
Contract AF19 604 6655, Proj. 5635, Task 563502
AFCRL 65-199
Unclassified report

Descriptors: (*Electromagnetic waves, Scattering), Geometric forms, Spheres, Conical bodies, Cylindrical bodies, Diffraction, Reports, Scientific research.

The report summarizes the results of the research carried out at the Radiation Laboratory of The University of Michigan with the Air Force Cambridge Research Laboratories. The report covers activities during the period February 1960 to January 1965 and includes work on the preparation of reports presenting the electromagnetic scattering properties of regular bodies as well as original research in basic diffraction theory and nonlinear modeling. (Author)

AD-614 047 Div. 8, 25
CFSTI Prices: HC$2.00 MF$0.50

Fairchild Semiconductor Research and Development Labs., Palo Alto, Calif.
MICROWAVE SOLID-STATE GENERATORS.
Quarterly progress rept. no. 2, 1 Sep-30 Nov 64, by Richard A. Henschke. 30 Nov 64, 48p
Contract DA28 043AMC00120E, Proj. 1P6 22001A056
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Radiofrequency generators, Microwave equipment), (*Frequency multipliers, X band), (*Diodes (Semiconductor), Frequency multipliers), (*Transistors, Microwave oscillators), Microwave oscillators, Circuits, Broadband, Narrowband, Radiofrequency power, Transistor amplifiers.

A study was made of the circuit requirements for broadband diode doublers and triplers using an analytical approach based on the work of Penfield and Rafuse. Circuit requirements for narrow band and broadband multipliers were established from the theory and a logical design procedure was worked out. Corroborative experimental data are provided from results obtained for a 1 to 2 Gc doubler and a 2 to 6 Gc tripler which operate efficiently, on a fixed tuned basis, over bandwidths of at least 4%. Application of these results to the design of multipliers for an X-Band Source is indicated. A discussion is presented of the problems associated with the construction of an operable driver oscillator using parallel transistors. Preliminary results of multiplier diodes are mentioned. (Author)

AD-614 055 Div. 8
CFSTI Prices: HC$2.00 MF$0.50

S F D Labs., Inc., Union, N. J.
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
Quarterly progress rept. no. 8, 1 Sep-31 Dec 64, by H. L. McDowell and A. Wilczek. Feb 65, 39p
Contract AF30 602 2533, ARPA Order 136 61
RADC TR-65-83
Unclassified report

See also AD-614 995.

Descriptors: (*Microwave amplifiers, L band), (*Electron tubes, Microwave amplifiers), (*Crossed field devices, Microwave amplifiers), Reliability (Electronics), Electrodes, Electron tube parts, Secondary emission, Impedance matching.

Life tests were continued on the Group C, SFD-209 Tubes. Tubes L48E and D37F have operated for 4932 hours and 2368 hours respectively. The life test program has now accumulated a total of 11,881 life test hours. Construction and RF testing of the group D design tubes was completed. Tube F63F was tested to 1500 watts average power with a 200 microsecond pulse. The performance of tubes F63F and G35F proved that the dependence of performance characteristics on anode-cathode spacing can be predicted. The operating efficiency of tube L7F indicates that, by increasing end hat diameter, the efficiency is raised above 50% at all frequencies in the operating band. Tube J4F indicated that matrix impregnated cathodes, processed in accordance with standard techniques, do not necessarily develop a high secondary emission ratio. The variations in impedance match from tube to tube can be traced to the design of the susceptive matching tabs and the output and input line assembly technique. (Author)

AD-614 069 Div. 8
CFSTI Prices: HC$4.00 MF$0.75

Lincoln Lab., Mass. Inst. of Tech., Lexington.
DEVELOPMENT OF HELICAL PHASE-SHIFTERS.
Final rept.,
by Hugh A. Hair. Dec 64, 107p
Contract AF19 628 500
Unclassified report

Subcontracted to General Electric Co., Syracuse, N. Y.

Descriptors: (*Phase shifters, Helixes), (*Ferrites, Phase shifters), Phased arrays, Radar antennas, Electromagnetic pulses, L band, S band, Switching circuits, Magnetic fields, Magnetic properties, Temperature, Dielectrics, Liquids, Solids, Voltage, Propagation.

A latching phase shifter was developed which makes use of a shielded helix as the microwave circuit. A ferrite tube placed inside the helix is circumferentially magnetized by passing a current through a single wire placed along the axis of the tube. The phase-delay of an RF wave on the helix depends on the sense and magnitude of the circumferential magnetization of the ferrite tube. Positive and negative switching current pulses magnetize the ferrite to remanence in either of the two senses, and result in a differential phase-delay of the RF wave. The slow-wave helix considerably reduces the ferrite volume required for a phase change of 360 degrees, and the microsecond switching times are readily achieved with very low switching power. A theoretical model for the dominant nonlinear mechanism is proposed and analyzed; and the results are correlated with experimental data. Using these results, high peak power phase-shifters were designed and tested at L- and S- band frequencies. For high average power capability, the ferrite must be cooled; the resulting thermal design problems are discussed. The choice of both ferrite and dielectric materials for L- and S-band frequencies are discussed with the emphasis placed on commercially available materials.

AD-614 074 Div. 8, 25, 26
CFSTI Prices: HC$1.00 MF$0.50

Bulova Watch Co., Woodside, N. Y. Electronics Div.
PRODUCTION ENGINEERING MEASURE FOR TYPE CR-(XM-60)/U CRYSTAL UNITS.
Quarterly rept. no. 2, Oct-Dec 64, by R. F. Woolley. Dec 64, 25p Unclassified report
Contract DA36 039AMC03633E
See also AD-611 131.

Descriptors: (*Crystals, Semiconductor devices), (*Crystal holders, Manufacturing methods), Quartz, Etched crystals, Welding, Aging (Materials), Low frequency, Quality control, Specifications, Design, Preparation, Calibration.

The report details the fabrication techniques and yields obtained in the processing of the 900 Crystal Unit, type CR-47A/U, prepared for the purpose of determining reliability criteria. Crystal design specification sheets are included. Results to date of investigations of process improvements in lead attachment and evacuated, kold-weld, sealed units are reported. Additional facilities and personnel acquired during the period are also included. (Author)

AD-614 075 Div. 8
CFSTI Prices: HC$3.00 MF$0.50

Ground Electronics Engineering-Installation Agency, Griffiss AFB, N. Y.
ANTENNA WIRE SAG AND TENSION CALCULATIONS,

by T. Prossner. Feb 65, 51p
Technical rept. no. GEEIA-TR-65-1

Unclassified report

Descriptors: (*Electrical cables, Antennas), (*Antennas, Design), (*Wire, Antennas), Structures, Stresses, Loading (Mechanics), Antenna masts, Design, Antenna configurations.

The report reviews some of the basic concepts of sag in cables associated with antenna structures. Although the function of antenna wires is to provide an electronic transmitting or receiving medium, the wire or cable also has a structural task. Under conditions of least loading, this wire must still support its own weight; when additional loadings caused by wind and ice are added, these cables or wires actually perform as structural catenaries. More complex stresses can be caused by vibration, temperature change, deformation under load, and by pre-stress. The report is concerned primarily with rhombic antennas, both horizontal and sloped. The effect of sag and tension of cables on the supporting towers or poles is discussed.

AD-614 078 Div. 8
CFSTI Prices: HC$3.00 MF$0.75

Washington Univ., Seattle. Coll. of Engineering.
DIPOLE EXCITED UNIDIRECTIONALLY CONDUCTING SPHERE.
Scientific rept.,
by Akira Ishimaru and Manuel A. Gonzalez. Oct 64,
64p Technical rept. no. TR-85
Contract AF19 628 2763, Proj. 5635, Task 563502
AFCRL 64-919

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Spiral antennas, Antenna radiation patterns), (*Antenna radiation patterns, Spiral antennas), Spheres, Model tests, Broadband, Potential theory, Vector analysis, Green's function, Boundary value problems.

The problem of frequency independent antennas has aroused the interest of many authors in recent years. In this work an attempt is made to solve the problem of a unidirectionally conducting sphere excited by a radial point source. As it is well known, a unidirectionally conducting surface constitutes, under certain restrictions, a good approximation to a surface consisting of many closely spaced conductors; by choosing the direction of conduction on the sphere to be an equiangular spiral, an approximate mathematical expression was obtained for the fields produced by a spherical spiral antenna. This antenna exhibits certain broad band characteristics all of which are kept by the unidirectionally conducting surface. A study of this surface revealed considerable physical insight on the behavior of the spiral antenna. The problem is formulated in terms of vector potentials and solved by the method of characteristic Green's functions. The complexity of the formal solution necessitates approximations which lead to asymptotic estimates of the far zone radiation field.

AD-614 084 Div. 8, 12, 25
CFSTI Prices: HC$3.00 MF$0.75

Mithras, Inc., Cambridge, Mass.
RESEARCH OF AERODYNAMIC METHODS OF PRODUCING ANTENNA WINDOWS IN A PLASMA SHEATH.
Scientific rept. no. 1, 14 Oct 63-19 Oct 64,
by Richard H. Adams and Joseph J. Rossi. Oct 64,
97p Rept. no. MC-63-78-R1
Contract AF19 628 3852, Proj. 4642, Task 464202
AFCRL 65-65

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Plasma sheath, Wave transmission), (*Reentry vehicles, Plasma sheath), (*Antennas, Plasma sheath), (*Radio signals, Attenuation), Aerodynamic characteristics, Conical bodies, Blunt bodies, Sheets, Jets, Coolants, Nozzle gas flow, Gas flow, Ions, Penetration, Supersonic flow, Helium, Cooling, One-dimensional flow, Thermodynamics.

Two aerodynamic methods of creating transmission 'windows' in typical plasma sheaths surrounding re-entry vehicles have been investigated: (1) the use of jets of coolant from flush nozzles which penetrate across the plasma slab and then mix with the ionized gases as they are carried downstream, (2) the use of a physical flow diverter to bypass some of the ionized flow laterally around the antenna. Equations are developed for the lateral jet penetration in a supersonic stream and for one-dimensional mixing for both perfect gases and real gases in thermodynamic equilibrium. The assumption of real-air equilibrium thermodynamics yields coolant requirements considerably below the perfect gas values for the jet injection method. It is concluded that the jet injection method will reduce a 200 mc. signal attenuation to 3 db. with modest jet flow rates of helium on a typical re-entry trajectory. Conversely, the use of a physical flow diverter is not an effective method of creating a transmission window where the ionization layer is not adjacent to the vehicle surface or where the attenuation needs to be reduced more than 10 db. (Author)

AD-614 090 Div. 8, 25
CFSTI Prices: HC$4.00 MF$0.75

Motorola, Inc., Phoenix, Ariz. Semiconductor Products Div.
SMALL SIGNAL SEMICONDUCTOR COMPOSITES.
Final rept. for 1 Jul 63-30 Jun 64,
by James Feit. 30 Jun 64, 110p
Contract DA36 039AMC03212E

Unclassified report

Descriptors: (*Radio equipment, Microminiaturization (Electronics)), (*Semiconductor devices, Integrated circuits), (*Integrated circuits, Design), Intermediate frequency amplifiers, Limiters, Discriminators, Automatic gain control, Audio amplifiers, Silicon compounds, Dioxides, Semiconducting films, Capacitors, Resistors, Transistors, Diodes (Semiconductors), Radio receivers, Portable.

The steps taken in the design, evaluation and fabrication of linear integrated circuits which have performance similar to circuits utilized in manpack communications gear are listed. Specifically, four circuits were developed and fabricated: (A) IF amplifier. A low power drain stage capable of 20 db cascaded power gain at 455 kc. (B) Limiter. A low power drain stage with sufficient power output at 455 kc to drive a discriminator. (C) Squelch. A low power drain stage with the capability of suppressing audio output by 50 db. (D) Audio. A circuit with low standby power drain, 50 db power gain and 100 mw audio output. As a demonstration vehicle for these integrated circuits, an interim integrated circuit receiver was designed utilizing the linear integrated circuits described for the receiver back end. For the r-f, mixer and oscillator functions, integrated circuits designed for other applica-

tions were adapted. These front end circuits permit demonstration of the receiver, but introduce a very heavy power drain. The receiver was constructed using passive external components where necessary. Performance of the demonstration receiver meets or exceeds the specifications of the AN/PRR-9 manpack radio. (Author)

AD-614 092 Div. 8, 25
CFSTI Prices: HC$1.00 MF$0.50

Electrical Engineering Research Lab., Univ. of Illinois, Urbana.
MILLIMETER WAVE GENERATION BY MULTIPLE QUANTUM CONVERSION.
Abstract,
by Donald P. Akitt and Paul D. Coleman. 1964, 4p
Grant AF AFOSR272 63, Proj. 9767, Task 976702
AFOSR 65-0448
Unclassified report

Abstract of a paper presented at the Annual Review of Electronics (2nd), Univ. of Illinois, Urbana, 17-18 Nov 64.

Descriptors: (*Millimeter waves, Oscillators), (*Quantum mechanics, Radiofrequency oscillators), Magnetrons, Gases, Hydrogen compounds, Cyanides, Pumping (Electronics), Electron transitions, Photons.

This paper describes an experiment in which approximately one watt of power was produced at 105 Gc by a traveling wave multiple photon interaction in HCN gas.

AD-614 103 Div. 8, 12
CFSTI Prices: HC$3.00 MF$0.75

Battelle Memorial Inst., Columbus, Ohio.
RELIABILITY OF INTEGRATED CIRCUITS USED IN MISSILE SYSTEMS,
by J. L. Easterday, R. G. Bowman, W. L. Gahm, and B. C. Spradlin. 30 Oct 64, 75p
Contract DA01 021AMC203Z
RSIC 330
Unclassified report

Descriptors: (*Integrated circuits, Reliability (Electronics)), (*Reliability (Electronics), Integrated circuits), Guided missile components, Microminiaturization (Electronics), Silicon, Military requirements.

Failure rates for off-the-shelf silicon monolithic integrated circuits were established on the basis of some 68 million parttest hours of data. No failures were reported for operating-life tests at 25C, so it can be determined only that the failure rate is less than an upper 60 percent confidence limit of 0.067 percent per 1000 hours. The observed failure rate from system and field operational tests was 0.012 percent per 1000 hours (0.022 percent per 1000 hours at 60% upper confidence limit). At 125C, the observed operating-life failure rate for laboratory tests was 0.087 percent per 1000 hours. Estimated failure rates for laboratory storage tests range from 0.0055 at 25C (extrapolated) to 0.22 at 150C, and 2.4 at 300C.

AD-614 110 Div. 8, 5
CFSTI Prices: HC$4.00 MF$1.00

Lincoln Lab., Mass. Inst. of Tech., Lexington.
DIGITAL COMMUNICATION OVER FIXED TIME-CONTINUOUS CHANNELS WITH MEMORY, WITH SPECIAL APPLICATION TO TELEPHONE CHANNELS,
by J. L. Holsinger. 20 Oct 64, 122p
Technical rept. no. TR-366
Contract AF19 628 500, ARPA Order 512
ESD TDR-64-564 Unclassified report

Rept. on Proj. VELA-UNIFORM.
Rept. prepared in cooperation with Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge, Technical rept. no. 430.

Descriptors: (*Data transmission systems, Telephone lines), (*Telephone communication systems, Digital systems), (*Digital systems, Data transmission systems), (*Communication theory, Digital systems), Mathematical models, Signal-to-noise ratio, Errors, Probability, Coding, Modulation, Optimization.

The channel model assumed is a linear, time-invariant filter followed by additive, colored Gaussian noise. A general problem formulation is introduced which involves use of this channel once for T seconds to communicate one of M signals. Two questions are considered: (1) given a set of signals, what is the probability of error. and (2) how should these signals be selected to minimize the probability of error. It is shown that answers to these questions are possible when a suitable vector space representation is used, and the basis functions required for this representation are presented. Using this representation and the random coding technique, a bound on the probability of error for a random ensemble of signals is determined and the structure of the ensemble of signals yielding a minimum error bound is derived. The interrelation of coding and modulation in this analysis is discussed and it is concluded that: (1) the optimum ensemble of signals involves an impractical modulation technique, and (2) the error bound for the optimum ensemble of signals pro vides a 'best possible' result against which more practical modulation techniques may be compared. (Author)

AD-614 112 Div. 8, 20, 25, 30
CFSTI Prices: HC$3.00 MF$0.75

General Dynamics/Fort Worth, Tex. Nuclear Aerospace Research Facility.
FIRST TEST ON RADIATION EXPERIMENTATION FOR THE Q-FACTOR TECHNIQUE.
Final rept. for 1 Oct 63-30 Sep 64,
by B. E. Curtsinger and A. R. Robinson. Feb 65, 53p Rept. no. FZK-207
Contract AF29 601 6213, Proj. 6773, Task 677302
WL TR-64-146
Unclassified report

Descriptors: (*Transistors, Radiation damage), (*Radiation damage, Transistors), Gain, Neutron flux, Test reactors, Radiation measurement systems, Test equipment (Electronics).

Seventy-six transistors were irradiated under closely controlled environmental conditions and bias levels. Data were taken on the transistors during irradiation and during periods of reactor shutdown. Ten 2N914 transistors, twenty 2N709 transistors, and forty-nine 2N1613 transistors were irradiated. The report contains discussions of test technique, description of the test, and dosimetry results. (Author)

AD-614 116 Div. 8, 1, 25
CFSTI Prices: HC$5.00 MF$1.00

Naval Ammunition Dept, Crane, Ind.
MICRO-NOTES. INFORMATION OF MICROELECTRONICS FOR NAVY AVIONICS EQUIPMENT.
1 Apr 65, 165p Micro-notes no. MN-11,
NAD-65-251
Tasks RAV03D001 3231R008 03 01,
RAV03J002 2021R008 03 01
Unclassified report

Prepared in cooperation with Naval Air Development Center, Johnsville, Pa.
See also AD-612 060.

Descriptors: (*Naval equipment, Microminiaturization (Electronics)), (*Microminiaturization (Electronics), Naval equipment), (*Electronic equipment, Airborne), Integrated circuits, Thermal properties, Heat transfer, Epitaxial growth, Semiconductor devices, Power supplies, Standarization, Amplifiers, Differentiating circuits, Tests, Performance (Engineering).

Contents: Study of thermal aspects of heat dissipation techniques in integrated circuitry; Epitaxial studies - Part II; Microelectronic power supply for the Naval Research Laboratory; Integral electronics definitions; Fairchild differential amplifier evaluations; Evaluation of Texas Instruments' general purpose (Minuteman type) and Read amplifiers; Evaluation of Fairchild TT micro L103 integrated circuit.

AD-614 118 Div. 8, 26
CFSTI Prices: HC$2.00 MF$0.50

National Co., Inc., Melrose, Mass.
PRODUCTION ENGINEERING MEASURE FOR CESIUM BEAM TUBES.
Quarterly progress rept. no. 6, 23 Aug-23 Nov 64, by James George. 23 Nov 64, 49p
Contract DA36 039AMC01457

Unclassified report

Descriptors: (*Microwave equipment, Cesium electron tubes), (*Cesium electron tubes, Manufacturing methods), Waveguide windows, Electron tube parts, Electron tube heaters, Vacuum pumps, Molybdenum, Ion beams, X-band, Ionic current, Electromagnetic shielding, Magnets, Ion accelerators, Electron multipliers.

The life test of the retrofitted PEM-E3 cesium beam tube was continued with satisfactory results (See AD-614 118). Design and parts fabrication for the original PEM-E5 and PEM-E6 cesium beam tubes were completed. These tubes (PEM-E5 and PEM-E6) were assembled, processed, aligned, tested, and subjected to corrective redesign and retrofitting. The retrofitted PEM-E5 and PEM-E6 tubes were then assembled, processed, aligned, and tested. Only two problem areas remain unresolved in the retrofitted PEM-E5 and PEM-E6 tubes: low signal output and rf power mismatch. Two completely new beam tubes (incorporating the improved design characteristics of the retrofitted PEM-E5 and PEM-E6 tubes) will be built to resolve these problems. During this reporing period, charts showing the fabrication, assembly, processing, alignment, and testing sequences for the PEM-E5 and PEM-E6 tubes were prepared. (Author)

AD-614 122 Div. 8
CFSTI Prices: HC$4.00 MF$1.00

Laboratory for Electroscience Research, New York Univ., N. Y.
THEORY AND DESIGN OF FREQUENCY CONVERTERS USING COMBINATIONS OF PARAMETRIC ELEMENTS.
Doctoral thesis,
by Jacob Klapper. Feb 65, 132p
Scientific rept. no. SR-14, TR-400-105
Contract AF19 628 379, Proj. 5628, Task 562806
AFCRL 65-105

Unclassified report

Descriptors: (*Frequency converters, Nonlinear systems), Parametric amplifiers, Broadband, Bandwidth, Gain, Pumping (Electronics), Electrical properties, Design, Theory.

This dissertation treats the theory, gain-bandwidth limitations and optimum design of frequency converters comprised of both reactive and resistive nonlinear elements. These combinations exhibit a number of interesting and useful properties not found in circuits with only a single type of nonlinear element. When the resistive and reactive nonlinear elements are pumped in time-quadrature, the forward gain is maximized while the reverse gain and noise figure are minimized. Lower-frequency pumping is found possible with first order nonlinearities. The nonlinear RC, RL and RLC converters have respectively what is termed second, fourth and sixth order types of input-output isolation. The fundamental gain and bandwidth limitations of the converters are discussed in detail. The non p.r. converter admittances are approximated by a linear RLC network which incorporates their frequency dependence over the passband. The theory of broadband matching is then utilized to yield the fundamental gain-bandwidth limitations. (Author)

AD-614 123 Div. 8, 20
CFSTI Prices: HC$2.00 MF$0.50

Chalmers Univ. of Tech., Gothenburg (Sweden).
SOME FREQUENCY AND POWER CONVERSION PROPERTIES OF CYCLOTRON WAVES,
by Olle Nilsson. 1 Jan 65, 35p
Technical note no. TN-5, RR-50
Contract AF 61 052 594
RADC TR-65-155

Unclassified report

Descriptors: (*Parametric amplifiers, Cyclotron waves), (*Cyclotron waves, Power amplifiers), (*Power amplifiers, Cyclotron waves), Electron beams, Frequency multipliers, Microwave equipment, Electromagnetic waves, Pumping (Electronics), Traveling-wave tubes, Numerical analysis, Frequency, Sweden.

Adler tube type devices are considered. Fast cyclotron waves at one or several discrete frequencies are excited on the electron beam by the use of a Cuccia coupler. The modulated beam is shot through a 2n-pole where, contrary to the usual pumping procedure, power is extracted from the cyclotron waves. An analysis of the frequency and power conversion properties of a cyclotron wave excited 2n-pole is carried out. An experiment was made where an electron beam, carrying fast cyclotron waves of frequencies, was shot through a quadrupole. Finally an Adler tube with two quadrupoles between the input and output Cuccia couplers is considered. One of the quadrupoles extracts a fraction of the signal power at twice the signal frequency and serves as the source of the pump voltage which is fed to the other quadrupole via an external amplifier. Thus the pump voltage is phase locked to the signal. The properties of the basic types of this amplifier are discussed. (Author)

AD-614 124 Div. 8
CFSTI Prices: HC$2.00 MF$0.50

Centre de Physique Electronique et Corpusculaire, Orsay (France).
GENERATION OF INFRAMILLIMETRIC WAVES BY MEANS OF ELECTRONIC BEAMS.
Technical rept. no. 4, 1 Apr-31 Jul 64.
31 Jul 64, 29p Rept. no. WR-1344
Contract AF61 052 715
RADC TR-65-162

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.
See also AD-603 183.

Descriptors: (*Backward-wave oscillators, Millimeter waves), (*Electron beams, Backward-wave oscillators),

Radiofrequency oscillators, Electron guns, Crystal detectors, Electron tubes, Manufacturing methods, Electrical properties, Design, Performance (Engineering), Feasibility studies.

The objectives of the contract are the extention of the state of the art of O-type carcinotron oscillators to the generation of submillimeter waves down to 0.3 mm. Laboratory models of experimental tubes are designed to meet the following electrical requirements: Center frequency 950 Gc/s, Bandwidth 5 to 10%, power output 10 milliwatts C.W., maximum voltage 10,000 volts, magnetic field 7000 gauss (electro-magnet), and life time 100 hours.

AD-614 125 Div. 8
CFSTI Prices: HC$1.00 MF$0.50

Microwave Electronics Corp., Palo Alto, Calif.
A THREE-WATT LOW-NOISE TRAVELING-WAVE TUBE FOR C-BAND.
Interim development rept. no. 3, 1 Jan-30 Mar 65, by J. R. Largent and W. E. Waters. Apr 65, 13p
Contract NObsr91322, Proj. SFO 100201, Task 9294
Unclassified report

See also AD-610 387.

Descriptors: (*Traveling-wave tubes, C-band), Design, Helixes, Voltage, Standing wave ratios, Magnetrons, Radiofrequency power, Focusing, Electron guns, Gain, Solenoids, Magnets, Noise (Radio).

Helix matches, both input and output, with VSWR's less than 2:1 have been achieved. Four magnetron injection gun tubes and one parallel flow gun have been tested. Preliminary rf measurements indicate a high probability that all design objectives are obtainable. (Author)

AD-614 141 Div. 8

Air Force Cambridge Research Labs., Bedford, Mass.
A SYMBOLIC NOTATION APPLIED TO UNBALANCED LADDER NETWORKS.
Physical sciences research papers, by Kurt H. Haase. Feb 65, 16p
Paper no. PSRP-82, AFCRL 65-126
Proj. 5628, Task 5628 06
Unclassified report

Pub. in Nachrichtentechnische Zeitschrift v17 n11 p572-8 Nov 1964 (Copies available only to DDC users).

Descriptors: (*Circuit, Theory), (*Electrical networks, Mathematical logic), (*Mathematical logic, Electrical networks), Admittance, Electrical impedance, Binary arithmetic, Topology.

A symbolic notation is used to describe the driving-point immittances measured at either port of an unbalanced two-port ladder network containing two kinds of elements (LC, RC, or RL). It is shown that using this notation, distinctive letter symbols with indices together with operator symbols, and by applying some logical rules, the relationship between input and output immittances, between dual and between identical ladders becomes very simple. The symbolic notation is more descriptive and pictorial in the light of circuit theory than the correlated mathematical formulations. The article is a first attempt to apply logical considerations to circuit problems and wants to give some stimulation for further studies in this direction. (Author)

AD-614 222 Div. 8

Microwave Electronics Corp., Palo Alto, Calif.
MEDIUM-POWER, LOW-NOISE TUBE DEVELOPMENT.
Interim development rept. no. 13, phase 2, 1 Mar-31 May 64, Sep 64, 19p
Contract Nonr347000X
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Traveling-wave tubes, Environmental tests), Noise (Radio), Performance (Engineering), Vibration, Shock (Mechanics), Temperature, Electron guns, Magnetic fields, Gain, Specifications.

During the work period covered, five vacuum envelopes were tested. A tube having all specified electrical performance was subjected to temperature, shock and vibration testing. (Author)

AD-614 223 Div. 8
CFSTI Prices: HC$2.00 MF$0.50

Systems, Inc., Orlando, Fla.
PEM FOR FILTER, QUARTZ CRYSTAL, 112 MC, TYPE EL-FR (X-2) AND CRYSTAL UNIT, FILTER, QUARTZ TYPES CR-(XM-64)/U AND CR-(XM-65)/U.
Quarterly progress rept. no. 1, 30 Oct 64-30 Jan 65, 30 Jan 65, 27p
Contract DA36 039AMC03638E
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Quartz, Resonators), (*Band-pass filters, Quartz), Crystals, Very high frequency, Narrowband, Electronics, Specifications, Performance (Engineering), Parametric amplifiers, Design.

The objectives and requirements of this program are described. Filter design considerations are discussed briefly. Results of the initial crystal investigation are given. Spurious modes have been suppressed by 20 to 30 db on experimental units and the Q requirements of 60,000 have been obtained. (Author)

AD-614 227 Div. 8
CFSTI Prices: HC$2.00 MF$0.50

Arinc Research Corp., Washington, D. C.
SYSTEM RELIABILITY PREDICTION BY FUNCTION,
by Harold Balaban. Mar 65, 27p
Contract AF30 602 2838, Proj. 5588, Task 558802
RADC TDR-63-300 suppl 1
Unclassified report

Descriptors: (*Reliability (Electronics), Mathematical prediction), (*Mathematical prediction, Electronic equipment), Ground support equipment, Life expectancy, Malfunctions, Statistical analysis.

The report presents a set of revised equations for ground system reliability prediction. The basic approach and data are the same as were used in the original study described in AD-416 494 and AD-418 192. The original equations were revised and simplified. Three prediction equations are presented based on five equipment characteristics. Also included are methods for computing the confidence interval for the estimated mean life. (Author)

AD-614 240 Div. 8, 2

Smyth Research Associates, San Diego, Calif.
TRADEWIND DUCTING.

Final technical rept. for 18 Apr-18 Nov 64,
by E. D. Bowen, W. J. Fay, and D. R. Munoz. Feb 65,
103p Rept. no. SRA-425
Contract AF30 602 3363, Proj. 4519, Task 451902
RADC TR-64-549

Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Radio signals, Propagation), (*Troposphere, Radio transmission), (*Radio communication systems, Propagation), Very high frequency, Temperature inversion, Marine meteorology, Radio ranges, Hawaii, California, Television equipment.

An experimental research program is described in this report. The experiment was conducted to gain additional information on the Tradewind Duct mode for VHF communications over the 2500 mile path between Hawaii and Point Buchon on the central California coast. Medium power TV transmitters situated at Maui and Hilo were used as the source, and SRA - 506 phase-locked receivers and medium to high gain antennas were used at the receiving site. Multiple frequencies between 60 and 212 mc/s were used. Data concerning the signal strength versus time, height gain at the receiving terminal, and meteorological data along the path were obtained. This report describes the seasonal and diurnal duty cycle of the ducting mode of propagation and the fading rate and fading depth of the signal received. Correlation between the transmission loss and duty cycle and the meteorological data yields information on the feasibility of predicting this propagation mode. The cumulative distributions of the basic transmission losses are displayed. (Author)

AD-614 244 Div. 8
CFSTI Prices: HC$2.00 MF$0.50

Electron Physics Lab., Univ. of Michigan, Ann Arbor.
VELOCITY TAPERING IN MICROWAVE AMPLIFIERS.
Interim rept.,
by J. E. Rowe and C. A. Brackett. Mar 65, 46p
Technical rept. no. TR-81
Contract AF30 602 3569, Projs. 5573, 06847,
Task 557303
RADC TR-64-554

Unclassified report

Descriptors: (*Microwave amplifiers, Theory), Electrons, Radio waves, Synchronization (Electronics), Phase shift, Theory, Klystrons, Electron tubes, Traveling-wave-tubes, Energy conversion, Taper, Velocity.

The low to moderate r-f conversion efficiencies characteristic of kinetic energy conversion devices may be enhanced by appropriately tapering the r-f circuit phase velocity. The nonlinear interaction equations have been solved in closed form for an HKB (hard-kernel-bunch) model to obtain an optimum taper form. Several velocity taper forms have been investigated in experimental amplifiers and the power output, gain, efficiency and phase shift characteristics of these amplifiers are discussed in detail. Conversion efficiencies up to 50 percent and near constant output power for a 20 db variation in r-f drive power have been realized in near optimally tapered circuit amplifiers. Further improvements realized include operation at a single voltage for maximum gain and power output and a nearly linear phase shift characteristic for a ± 10 percent voltage modulation. (Author)

AD-614 251 Div. 8
CFSTI Prices: HC$1.00 MF$0.50

S F D Labs., Inc., Union, N. J.
DEVELOPMENT OF AN X-BAND CW CROSSED-FIELD AMPLIFIER.
Interim development rept. no. 7, 1 Jan-31 Mar 65,
by J. Hentschel. Apr 65, 23p Rept. no. SFD-33-IDR-7
Contract NObsr89503

Unclassified report

Descriptors: (*Microwave amplifiers, Crossed field devices), (*Crossed field devices, Microwave amplifiers), X band, Helexes, Circuits, Transmission lines, Tests, Performance (Engineering).

Net gains of up to 13 db have been measured using the new helix coupled vane circuit. A nominal net gain of 10 db has also been achieved with essentially constant voltage over the full 15% frequency range of the driver magnetron. Signals well below the expected levels have provided sufficient locking power across this same bandwidth. (Author)

AD-614 253 Div. 8, 25
CFSTI Prices: HC$4.00 MF$0.75

Microwave Associates, Inc., Burlington, Mass.
STUDY OF PLASMA AMPLIFIERS.
Final rept.,
by K. K. Chow. 15 Feb 65, 115p
Contract AF19 628 452, Proj. 4645, Task 464502
AFCRL 65-158

Unclassified report

Descriptors: (*Microwave amplifiers, Plasma physics), (*Plasma medium, Microwave amplifiers), (*Lasers, Resonance), Cesium, Vapors, Gas ionization, Generators, Optical phenomena, Oscillation, Bromine, Argon, Helium, Emissivity.

An investigation on the amplification of electromagnetic signals interacting with a plasma was carried out. Specifically, use of recombination radiation at optical frequencies is considered. Theoretical considerations for optical frequencies indicate that a low temperature plasma with high density, high degree of ionization is necessary. Thermal-contact ionization of cesium is chosen as the most suitable means. Fabrication of this plasma generator and the attendant technological problems are discussed in detail. Experimental results show that recombination radiation has been obtained in this type of plasma. However because of the low plasma density attainable, optical oscillation could not be initiated. Schemes are suggested to increase the density and degree of ionization. Studies on gas lasers were also carried out. Optical resonator modes in a Br2-Ar laser are examined in detail. Excellent agreement between experimental and theoretical results is obtained. (Author)

AD-614 268 Div. 8, 20
CFSTI Prices: HC$1.00 MF$0.50

Lockheed Missiles and Space Co., Sunnyvale, Calif.
EVALUATION OF FIELD-EFFECT TRANSISTORS.
Final rept.,
by Harold Y. Wong and William E. Price. 4 Oct 62,
21p LMSD-8-19-62-12

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Transistors, Radiation damage), (*Radiation damage, Transistors), Noise, Reliability, Tests, Gamma rays, Electric currents, Voltage, Statistical data, Test reactors.

The report, a joint effort between reliability and

nuclear effects describes the electrical parameters of field-effect transistors (FET) due to the effects of nuclear radiation. The report describes the method of measuring FET electrical parameters, a description of the radiation fields to which the FET's were subjected, and the analysis of the results of subjecting the FET's to a nuclear radiation environment.

AD-614 275 Div. 8
CFSTI Prices: HC$1.00 MF$0.50

Antenna Lab., Calif. Inst. of Tech., Pasadena.
ANTENNA RADIATION IN A MOVING DISPERSIVE MEDIUM,
by K. S. H. Lee and C. H. Papas. Feb 65, 21p
Technical rept. no. TR-34
Contract AF49 638 1266
AFOSR 65-0653

Unclassified report

Descriptors: (*Antenna radiation patterns, Plasma medium), (*Electromagnetic waves, Propagation), Magnetohydrodynamics, Wave transmission, Vector analysis, Fluid mechanics.

An idealized problem of calculating antenna radiation is examined for the case where the ambient medium is a homogeneous, spatially unbounded, ionized gas moving at a uniform velocity with respect to the antenna.

AD-614 280 Div. 8, 25
CFSTI Prices: HC$3.00 MF$0.75

Naval Ordnance Test Station, China Lake, Calif.
SILICON P-N JUNCTIONS AS AUTOMATIC GAIN CONTROL (AGC) ELEMENTS FOR VIDEO PULSES,
by Richard S. Hughes. Feb 65, 57p
Rept. no. NOTS-TP-3662
Task RM3781 001 216 1WW115 00 001
NAVWEPS 8630

Unclassified report

Descriptors: (*Automatic gain control, Diodes (Semiconductor)), (*Silicon, Diodes (Semiconductor)), (*Diodes (Semiconductor), Silicon), (*Video signals, Automatic gain control), Circuits, Amplifiers, Attenuators, Solid state physics.

The silicon P-N junction is studied from a theoretical standpoint, then compared with actual characteristics. The dynamic resistance characteristic is determined, and typical circuits are presented that illustrate how this variable resistance can be used to control gain (or attenuation) electrically. It is shown that there are four basic characteristics of gain versus AGC voltage: linear, logarithmic, (logarithmic) to the minus 1 power, hyperbolic. These characteristics depend on how the diodes are driven (voltage or current source) and where the diodes dynamic resistance appears in the circuit's gain equation. (Author)

AD-614 285 Div. 8, 7, 25
CFSTI Prices: HC$4.00 MF$1.00

Advanced Kinetics, Inc., Costa Mesa, Calif.
PLASMA KINETIC ENERGY - RF CONVERSION.
Final rept.
Feb 65, 128p
Contract AF30 602 2981, Proj. 5573, Task 557303
RADC TDR-64-550

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Radiofrequency power, Plasma physics), (*Plasma oscillations, Energy conversion), (*Energy conversion, Plasma physics), X band, K band, Electromagnetic waves, Electromagnetic pulses, Cyclotron resonance phenomena, Magnetic fields, Electric fields, Electron accelerators, X rays, Measurements, Cyclotron waves, Microwaves.

The effort was an extension of an experimental and theoretical investigation of microwave energy produced by cyclotron radiation from a plasma medium. Power densities several orders of magnitude higher than had been obtained previously by any investigator were experimentally measured. Power densities of hundreds of watts per cubic centimeter of X-band power were produced in the form of 100-500 nanosecond pulses. These high power densities indicate some ordering or coherency mechanism in this interaction. If this coherency can be enhanced and if this proves to be a true volume instead of surface interaction, this effort could result in microwave generators which are capable of producing power outputs far beyond any of those available from present generators. (Author)

AD-614 288 Div. 8
CFSTI Prices: HC$4.00 MF$1.00

Radiation Systems, Inc., Alexandria, Va.
INVESTIGATION OF A MULTIPLE BEAM SCANNING CIRCULAR ARRAY.
Final rept.,
by George G. Chadwick and John C. Glass.
13 Apr 64, 122p Rept. no. TR-46
Contract AF19 628 367, Proj. A1035

Unclassified report

Descriptors: (*Coupled antennas, Design), (*Antenna components, Performance (Engineering)), (*Multiple beam antennas, Design), Beams (Electromagnetic), Phase shifters, Antenna configuration, Antenna feeds, Dipole antennas, Excitation, Antenna radiation patterns, Scanning, Broadband.

The final technical report and the preceding first scientific report have completely described the effort expended in the investigation and analysis of the multiple-beam cylindrical array concept. The theoretical and experimental effort expended on the program have proved that the fundamental concept is plausible and practical. The results achieved with the four-element and 16-element fixed frequency multiple-beam arrays were in general accordance with the predicted data. The 4 x 8 multiple-beam cylindrical array attested to the fact that multiple beams could be formed at a number of elevation stations simultaneously. The broad bandwidth experiment showed that beams could be formed over an octave in frequency range and indeed it is expected that this performance could be extended over much larger frequency ranges. The analysis contained in Section 5.0 of the report outlines a general design procedure for achieving a given level of performance with the cylindrical array.

AD-614 297 Div. 8, 16, 25, 28

Decision Sciences Lab., Bedford, Mass.
IDENTIFICATION OF ELEMENTARY AUDITORY DISPLAYS: EFFECT OF UNBALANCED PROBABILITIES OF OCCURRENCE,
by Irwin Pollack and James Boynton. 18 Jun 63, 2p
Proj. 7682
ESD TDR-63-352

Unclassified report

Pub. in Journal of the Acoustical Society p1831-2 Nov 1963 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Communication theory, Speech recognition), (*Speech recognition, Communication theory), Speech transmission, Intelligibility, Auditory perception, Probability.

Listeners identified sound levels from a series in which one sound level occurred twice as often as each of six other sound levels. Unbiased measures of identification performance indicated that highest identification performance is achieved for the most frequently presented category and, that lowest identification performance is achieved for categories adjacent to the most frequent category. (Author)

AD-614 415 Div. 8, 28
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
FACTORS AFFECTING CODING ERRORS,
by Sidney Owsowtiz and Anders Sweetland. Apr 65, 35p Rept. no. RM-4346-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Coding, Communication theory), (*Communication theory, Coding), (*Errors, Coding), Cryptography, Numbers, Tests, Performance (Human), Perception (Psychology), Visual perception.

This Memorandum describes experiments which sought to identify the factors that contribute to coding errors. The experiments used code-stimulus materials: numeric codes, consisting only of numbers; alpha codes, consisting only of letters; alpha-numeric codes of mixed letters and numbers; and mnemonic codes (natural abbreviations, such as 'OVH' for 'overheated'). Only three-character codes were used. Major findings were: (1) Coding errors are proportional to the alpha content. (2) Errors committed with mixed codes reveal a position effect. (3) Perceptual set can increase or reduce error rates. (4) There was evidence of interaction (in the statistical sense) among the first, second, and third variables. (5) Unless perceptual set is specifically controlled most errors in recording mixed codes consist of 'substitutions of opposites'. (6) Over half the erroneous substitutions appeared to be non-random. (7) Nonrandom substitutions tended to be unidirectional. (8) Most coding errors (75 to 95 per cent) result from having a single digit in error. (9) The use of mnemonic codes did not reduce coding errors. (10) Letter-pattern familiarity affects coding errors. (11) Coding errors can be substantially reduced by providing keypunchers with a list of codes. (12) The amount of usable information that is retrievable from coded information depends on three factors: (a) the error rate; (b) the number of codes used; and (c) the number of codes possible with the format in question.

AD-614 425 Div. 8, 25
CFSTI Prices: HC$3.00 MF$0.75

Lincoln Lab., Mass. Inst. of Tech., Lexington.
SIGNAL DISTORTION IN A FREQUENCY DIVIDER,
by Joel Max. 12 Mar 65, 56p
Technical note no. TN-1965-11
Contract AF19 628 500
ESD TDR-65-59

Unclassified report

Descriptors: (*Frequency dividers, Signals), (*Signals, Distortion), (*Phase distortion, Frequency dividers), Bandwidth, Relaxation oscillators, Frequency multipliers, Solid state physics.

When a narrow band modulated signal excites a frequency division system, such as a chain of flip-flops, the low frequency output of the chain tends to exhibit the same bandwidth as the input signal. When the output of the divider is multiplied back up to the original frequency, the phase modulation of the original signal is recovered, together with distortion components whose magnitude depends on the details of the division process, in particular, on the percentage bandwidth of the signal at each step. A means for estimating the effective bandwidth of a phase on frequency modulated signal is developed and used to produce quantitative estimates of the signal degradation which results from a frequency division process. (Author)

AD-614 426 Div. 8
CFSTI Prices: HC$1.00 MF$0.50

Lincoln Lab., Mass. Inst. of Tech., Lexington.
MEASUREMENTS ON AN L-BAND POWER AMPLIFIER FOR PHASED ARRAYS,
by Lincoln Cartledge. 17 Mar 65, 14p
Technical note no. TN-1965-7
Contract AF19 628 500
ESD TDR-65-63

Unclassified report

Descriptors: (*Power amplifiers, L band), (*Phased arrays, Power amplifiers), Radiofrequency power, Bandwidth, Gain, Tuning devices, Tetrodes, Triodes, Phase (Electronics), Stability.

An L-band amplifier rated at 5 kw peak, .04 duty, 10% bandwidth, and 50 db gain has been developed outside Lincoln Laboratory. This amplifier consists of two triode and four tetrode stages and compares favorably with similarly rated TWT amplifiers, when size, weight and operating voltages are compared. Measurements of the amplifier's complex transfer function were made at Lincoln Laboratory. (Author)

AD-614 433 Div. 8, 26
CFSTI Prices: HC$2.00 MF$0.50

CTS Knights, Inc., Sandwich, Ill.
HIGH PRECISION 5 MC QUARTZ RESONATORS FOR TEMPERATURE CONTROL BETWEEN 20 AND 30 C.
Rept. no. 5, 10 Jun-10 Sep 64.
10 Sep 64, 28p
Contract NObsr89290, Proj. SS294001, Task 9215

Unclassified report

See also AD-611 182.

Descriptors: (*Quartz resonators, Temperature control), (*Temperature control, Quartz resonators), Aging (Materials), Processing, Temperature, Graphics, High frequency, Reliability (Electronics), Specifications, Tests.

The aging for periods of 10 to 28 days of 5th overtone units, operating between +20 and +30 C is discussed. (Author)

AD-614 434 Div. 8, 26
CFSTI Prices: HC$2.00 MF$0.50

CTS Knights, Inc., Sandwich, Ill.
HIGH PRECISION 5 MC QUARTZ RESONATORS FOR TEMPERATURE CONTROL BETWEEN 20 AND 30C.
Rept. no. 6, 20 Sep-10 Dec 64.
10 Dec 64, 36p
Contract NObsr89290, Proj. SS294001, Task 9215

Unclassified report

See also AD-614 433.

Descriptors: (*Quartz resonators, Temperature control), (*Temperature control, Quartz resonators), Aging (Materials), Processing, Temperature, Graphics, High frequency, Reliability (Electronics), Specifications, Tests.

Data on the aging of two room-temperature 5th overtone, 5 mc., quartz resonators is examined in detail to formulate hypotheses about rate of aging. (Author)

AD-614 446 Div. 8, 26

International Rectifier Corp., Los Angeles.
PRODUCTION ENGINEERING MEASURE. HIGH VOLTAGE SILICON RECTIFIER STACKS.
Quarterly progress rept. nos. 11-13, 25 Dec 63-25 Sep 64, by Arnold Conn and E. J. Diebold. 25 Sep 64, 22p
Contract DA36 039SC85977

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.
See also AD-603 501.

Descriptors: (*Diodes (Semiconductor), Rectifiers), (*Rectifiers, Silicon), Manufacturing methods, Test equipment, Production, Tests, Modules (Electronic), Reliability (Electronics).

Progress is reported on an investigation leading to the design, manufacture and manufacturing capability of compact high voltage silicon rectifier stacks.

AD-614 448 Div. 8, 26

Dumont (Allon B.) Labs., Fairchild Camera and Instrument Corp., Clifton, N. J.
12 INCH DIAMETER CATHODE RAY TUBE WITH FIBER OPTIC FACEPLATE.
Revision no. 1 to Quarterly progress rept. no. 1, 1 Jul-30 Sep 64,
by Madison Cawein. 25 Jan 65, 14p
SI-5874 rev. 1, MO-10159 rev. 1
Contract NOBsr91206, Proj. SF0070501, Task 6030

Unclassified report

Revision to rept. Program to Develop a 12 Inch Diameter Fiber Optic Faceplate Cathode Ray Tube, 20 Nov 64, AD-609 967.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Cathode ray tubes, Fiber optics), (*Fiber optics, Cathode ray tubes), Electron guns, Glass, Design.

Du Mont Laboratories finalized basic and component designs and developed a method for pre-testing the electron gun design. Historical test evaluation data indicates that the major cause of rejections of tubes similar to the 12BCP19 are the result of mis-alignment of electron gun components. Electron gun assemblies for this program will be individually tested in 12BCP19 blanks before sealing into a fiber optic tube. Prior to fabrication of the fiber optic faceplate tubes, two experimental units with plain glass dummy faceplates will be processed through all operations, thereby proving reliability of manufacturing operations. Preliminary studies and reviews disclosed limitations were imposed by the fiber optic supplier, also available fixtures for fiber optic faceplate fabrication limit the faceplate diameter to 11-7/8 inches (maximum). (Author)

AD-614 459 Div. 8

Centre de Physique Electronique et Corpusculaire, Orsay (France).
RESEARCH ON ONE MILLIMETER C. W. CARCINOTRON.
Final rept.
Dec 64, 201p Rept. no. WR-1318
Contract AF61 052 629
RADC TR-65-154

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.
See also AD-426 353.

Descriptors: (*Backward-wave oscillators, Very high frequency), Electron tubes, Millimeter waves, Electron guns, Circuits, Test equipment (Electronics), Field emission, Radiofrequency power, Performance (Engineering), Graphics, Mechanical drawings, Photographs.

New performances of 'O-type' Carcinotron delivering an C.W. output power of one to one and half watt at wavelengths in the neighbourhood of one millimeter (300 KMc/s) have been obtained. Tubes, in depressed collector operation, have given, at these frequencies, an efficiency of the order of 0.6 per cent. A bandwidth of 3 per cent (900 Mc/s) has been covered with a power of 500 milliwatts. (Author)

AD-614 468 Div. 8, 25
CFSTI Prices: HC$2.00 MF$0.50

Hughes Aircraft Co., Newport Beach, Calif.
MOLECULAR BANDPASS AMPLIFIERS.
Interim scientific rept. no. 2.
15 Oct 60, 44p
Contract AF33 616 7252

Unclassified report

Descriptors: (*Band-pass amplifiers, Diodes (Semiconductor)), (*Diodes (Semiconductor), Band-pass amplifiers), Tunnel diodes, Negative resistance circuits, Inductance, Capacitance, Transducers, Bandwidth, Resonance, Gain, Stability, Reliability (Electronics), Integration, Functions, Design.

The original objective of this research was to produce a bandpass amplifier by combining a tunnel diode with an inductive diode. It was discovered that the stability problems connected with this type of amplifier are more serious than originally estimated. New approaches with current stable negative resistance devices give better results, but none of these solutions are practical. More device research is necessary to produce reliable components. This report starts with an empirical design theory for single junction inductive diodes, then gives a general picture of the negative resistance amplifier. Stability and temperature problems are treated in detail. Experimental results with different type of bandpass amplifiers are discussed in the last section. (Author)

AD-614 469 Div. 8
CFSTI Prices: HC$1.00 MF$0.50

Microwave Electronics Corp., Palo Alto, Calif.
MEDIUM-POWER, LOW-NOISE TUBE DEVELOPMENT.
Interim development rept. no. 11, phase 2, 1 Sep-30 Nov 63. Sep 64, 12p
Contract Nonr347000X

Unclassified report

Descriptors: (*Traveling-wave tubes, Design),

Naval research, Specifications, Radiofrequency power, Noise (Radio), Ionic current, Helixes, Voltage, Backward-wave tubes, Velocity, Taper, Tests, Data.

During this quarter, the prototype design of the vacuum envelope and the PPM package unit was completed. Ten vacuum envelopes were built and tested. Operation of the tube was brought to within 1 db of the required 2-watt gain compression specification of 1 db. A backward wave oscillation prevents beam currents in excess of 18 milliamperes thereby limiting this gain compression. One tube, using vacuum envelope 40 was put through temperature and vibration environments. (Author)

AD-614 470 Div. 8
CFSTI Prices: HC$1.00 MF$0.50

Microwave Electronics Corp., Palo Alto, Calif.
MEDIUM-POWER, LOW-NOISE TUBE DEVELOPMENT.
Interim development rept. no. 12, phase 2, 1 Dec 63-28 Feb 64.
Sep 64, 15p
Contract Nonr347000X
Unclassified report

See also AD-614 469.

Descriptors: (*Traveling-wave tubes, Design), Naval research, Specifications, Radiofrequency power, Noise (Radio), Ionic current, Helixes, Voltage, Backward-wave tubes, Gain, Tests, Data.

During the work period covered by this report, ten M5088-type tubes were tested. A fundamental problem with spurious backward-wave oscillation was solved permitting a beam current increase to a value compatable with meeting noise figure specifications with less than 1-db gain compression at the 2-watt power output level. (Author)

AD-614 480 Div. 8
CFSTI Prices: HC$6.00 MF$1.25

Cooley Electronics Lab., Univ. of Michigan, Ann Arbor.
THEORY OF SIGNAL DETECTABILITY: COMPOSITE DEFERRED DECISION THEORY.
Summary rept. for 1963-1965,
by Richard A. Roberts. Mar 65, 234p
Technical rept. no. TR-161, 03674-5-T
Contract Nonr122436, Proj. NR187 200
Unclassified report

Descriptors: (*Signals, Detection), (*Decision theory, Detection), Sequential analysis, Communication theory, Signal-to-noise ratio, Optimization, Demodulation.

The theory of sequential detection problems is extended to procedures of a composite signal hypothesis, such as signals whose amplitude or phase is unknown. Observations of signal-and-noise are assumed not to be independent so that information can be extracted about the signal parameters for use in the detection process. The yes-no terminal decision must be made within a finite period. A general theory is presented for the solution of practical problems in the sequential detection of composite signal hypotheses. The theory specifies the optimum stopping rule needed for the sequential detector and the dependence between the observer's opinion of the cause of the reception and the distribution of the unknown signal parameters. The general theory implies the information that must be extracted from the observation is the likelihood ratio and the a posteriori signal parameter distribution. The form of the optimum detector, derived from the general theory, must include an adaptive capability, so that the signal parameter distribution can be sequentially updated. Applications of the general theory to a signal of unknown phase and a signal of unknown amplitude are presented. (Author)

AD-614 525 Div. 8, 30

National Research Council of Canada, Ottawa (Ontario).
NRC DESIGNS ANTENNA FOR S-BAND BEACON IN SOUNDING ROCKETS. RESONANT SHUNT-FED RADIATOR USES AIR DIELECTRIC TO WITHSTAND HEAT,
by F. V. Cairns and C. M. Spencer. 1965, 4p
NRC-8389
Unclassified report

Pub. in Canadian Electronics Engineering Mar 1965 (Copies available only to DDC users).

Descriptors: (*Antennas, Sounding rockets), (*Sounding rockets, Antennas), S band, High altitude, Telemeter systems, Antenna configurations, Dielectrics, Standing wave ratios, Design, Canada.

AD-614 554 Div. 8

Northwestern Univ., Evanston, Ill. Technological Inst.
A NOTE ON ACTIVE RC REALIZATION OF VOLTAGE TRANSFER FUNCTIONS.
Revised ed.,
by L. S. Bobrow and S. L. Hakimi. 15 Apr 65, 2p
Grants DA AROD31 124G223, AF AFOSR98 63
AROD 3298:16
Unclassified report

Pub. in IEEE Transactions of the Circuit Theory Group vCT-11 n4 p493-4 Dec 1964
(Copies not available to DDC or Clearinghouse customers)
Revision of manuscript submitted 16 Feb 64.

Descriptors: (*Electrical networks, Synthesis), (*Circuits, Electron tubes), Functions, Voltage, Resistance (Electrical), Capacitance, Algebra.

AD-614 560 Div. 8

Northwestern Univ., Evanston, Ill.
THE SENSITIVITY OF A TRAFFIC NETWORK,
by S. S. Yau. 1964, 13p
AROD 3298:15
Unclassified report

Pub. in Journal of the Franklin Institute v278 n6 p371-82 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electrical networks, Sensitivity), Capacitance, Synthesis, Theorems, Matrix algebra, Linear programming, Combinatorial analysis, Topology.

The sensitivity of a traffic network is defined for investigating the variations of the terminal capacities due to the decreases of the capacities of individual elements (stations and links). The sensitivity of a traffic network of n stations is described by a square matrix of order n, called the sensitivity matrix. The maximum off-diagonal entry in a sensitivity matrix is studied. From this information, a method is established for the design of a traffic network such that by using minimum individual element capacities no terminal capacities decrease beyond the specified tolerance when the expected decreases of the element capacities are given. (Author)

9. Fluid Mechanics

AD-613 915 Div. 9, 15

Stanford Univ., Calif.
HYPERSONIC VISCOUS FLOW NEAR THE STAGNATION STREAMLINE OF A BLUNT BODY: I. A TEST OF LOCAL SIMILARITY.
Revised ed.,
by Hsiao C. Kao. 3 Aug 64, 6p
Contract AF49 638 965; Grant AF AFOSR96 63
AFOSR 65-0597

Unclassified report

Pub. in A I A A Journal (U. S.) v2 n11 p1892-7
Nov 1964 (Copies not available to DDC or Clearinghouse customers).
Presented as Preprint 63-437 at the AIAA Conference on Physics of Entry into Planetary Atmospheres, Cambridge, Mass., August 26-28, 1963.

Descriptors: (*Hypersonic flow, Stagnation point), (*Blunt bodies, Hypersonic flow), Boundary layer, Partial differential equations, Numerical analysis, Atmosphere entry.

The flow near the stagnation streamline of a blunt body is often analyzed by using the approximation of local similarity, which reduces the equations of motion to a system of ordinary differential equations. This scheme is equivalent to truncating at one term a power-series expansion of the flow variables from the stagnation point, neglecting backward influence. The accuracy of such a truncation is examined. The principal assumption is that the Navier-Stokes equations are valid. In addition, it is assumed that the validity of the first truncation can be evaluated by comparing it with the second. The conclusion is that the usual assumption of local similarity is remarkably accurate for predicting flow quantities near the stagnation streamline. (Author)

AD-613 916 Div. 9

Stanford Univ., Calif.
HYPERSONIC VISCOUS FLOW NEAR THE STAGNATION STREAMLINE OF A BLUNT BODY: II. THIRD-ORDER BOUNDARY-LAYER THEORY AND COMPARISON WITH OTHER METHODS.
Revised ed.,
by Hsiao C. Kao. 3 Aug 64, 9p
Contract AF49 638 965; Grant AF AFOSR96 63
AFOSR 65-0598

Unclassified report

Pub. in A I A A Journal (U. S.) v2 n11 p1898-1906
Nov 1964 (Copies not available to DDC or Clearinghouse customers).
Presented as Preprint 63-437 at the AIAA Conference on Physics of Entry into Planetary Atmospheres, Cambridge, Mass., August 26-28, 1963.
See also AD-613 915.

Descriptors: (*Hypersonic flow, Stagnation point), (*Blunt bodies, Hypersonic flow), (*Boundary layer, Numerical analysis), Atmosphere entry, Shock waves, Spheres, Reynolds number, Partial differential equations, Integration.

The assumption of local similarity is used for predicting flow quantities near the stagnation streamline of a blunt body is adopted to calculate the third-order boundary-layer approximation in this region. The calculation is also made using viscous-layer approximation and direct integration through the shock wave. Comparisons are made to evaluate the relative applicability of these three approaches. It is found that third-order boundary-layer theory is valid in the range from intermediate to very high Reynolds numbers, but fails at low Reynolds number. Heat-transfer rates at the surface are compared with available experimental results. With reference to the various flow profiles plotted, a description is given of the development of the flow field from inviscid to low-Reynolds-number flow. (Author)

AD-613 939 Div. 9
CFSTI Prices: HC$3.00 MF$0.75

James Forrestal Research Center, Princeton Univ., N. J.
EXPERIMENTS ON THE LIFT AND DRAG OF SPHERES SUSPENDED IN A LOW REYNOLDS NO. POISEUILLE FLOW,
by S. Small. Aug 63, 59p Rept. no. FLD-11
Contract Nonr185825

Unclassified report

Rept. on Proj. SQUID.

Descriptors: (*Spheres, Fluid dynamic properties), (*Lift, Spheres), (*Drag, Spheres), Capillary tubes, Reynolds number, Cylindrical bodies, Nylon, Styrene plastics, Acrylic resins, Shear stresses, Boundary layer, Rotation, Mathematical analysis, Particle size.

An experimental investigation of the fluid dynamic forces on spheres suspended in a Poiseuille flow was performed. Small spheres of polystyrene, nylon, and lucite, having diameters ranging from 0.0610 inches to 0.1257 inches were suspended in Poiseuille flows in a 0.419 inch diameter tube. Variations in particle size and density, the fluid properties, and the angle of inclination of the tube, resulted in a sphere Reynolds number (based on particle diameter and approach velocity) ranging from 80 to 250. The results are presented as curves which include the coefficients of lift and drag plotted versus Reynolds number and a dimensionless shear parameter. Existing theory and experiment are carefully reviewed and compared with the experimental results. It was found that results valid in the Stokes regime cannot be successfully extrapolated into the higher Reynolds number range investigated. New qualitative relationships are suggested: (1) that the drag of a displaced sphere is the sum of centerline and displacement effects, and (2) that the lift has a square dependency upon the shear. (Author)

AD-613 972 Div. 9

Applied Physics Lab., Johns Hopkins Univ., Silver Spring, Md.
HANDBOOK OF SUPERSONIC AERODYNAMICS. VOLUME 5, SECTION 15. PROPERTIES OF GASES.
1 Aug 53, 239p
Contract NOrd7386
NAVORD 1488 V5

Unclassified report

Order from Superintendent of Documents, GPO, Washington, D. C. 20402, as D-215.7:1488/V5/SEC15, $2.00.
See also AD-613 056.

Descriptors: (*Supersonic flow, Handbooks), (*Aerodynamic characteristics, Handbooks), (*Gases, Physical properties), Airfoils, Chemical properties, Air, Thermodynamics, Transport properties, Tables, Dew point, Shock waves, Reliability, Chemical equilibrium.

Division 9 - FLUID MECHANICS

CONTENTS:
Composition of Air
Gas Imperfections
Thermodynamic Properties
Transport Properties
Prandtl Number
Dew Point
Isentropic Changes
Shock Front Conditions
Reliability
Tables of Real Properties of Air Dissociated to Chemical Equilibrium.

AD-613 973 Div. 9
CFSTI Prices: HC$1.00 MF$0.50

Hydrodynamics Lab., Calif. Inst. of Tech., Pasadena.
A CLASS OF MULTIPLE INTEGRALS OF THE STATIONARY PHASE TYPE OCCURRING IN THE THEORY OF WATER WAVES,
by D. K. Ai. Mar 65, 24p Rept. no. E-111.4
Contract Nonr22041

Unclassified report

Descriptors: (*Water waves, Mathematical analysis), (*Integrals, Fluid mechanics), Programming languages, Compilers, Data processing systems, Hydrodynamics.

A class of integrals which often occur in water wave problems are treated in this report. It is shown that these integrals are closely related to exponential integrals of complex arguments. A subroutine written in Fortran IV language is also given to serve as an example for numerical calculation. (Author)

AD-614 004 Div. 9
CFSTI Prices: HC$3.00 MF$0.75

Space Sciences Lab., General Electric Co., Philadelphia, Pa.
AN EXPERIMENTAL STUDY OF LAMINAR NEAR WAKES,
by E. P. Muntz and E. J. Softley. Apr 65, 67p
Rept. no. R64SD6
Contracts AF04 694 474, AF04 694 486

Unclassified report

Descriptors: (*Wake, Temperature), (*Blunt bodies, Wake), (*Conical bodies, Wake), Laminar flow, Aerodynamic heating, Heat transfer, Slender bodies, Reentry vehicles, Pressure, Nose cones, Reynolds number.

The near wakes of a 0.05 nose bluntness ratio, 10 degree half angle sphere cone were investigated. Direct measurements of static temperatures and densities were obtained between the body base and four base diameters downstream. The results indicate that the near wake static temperatures are sensitive functions of both Reynolds number and model surface temperature, but not of Mach number. Wake static temperatures decrease with increasing Reynolds number. The temperatures also decrease with decreasing wall temperature. Nose bluntness effects on wake temperatures were studied experimentally. For 0.05, 0.23 and 0.3 nose bluntness ratio 9 degree and 10 degree half angle sphere cones the maximum temperatures in the wakes increased with increasing nose bluntness ratio. Measurements of base pressure and heat transfer were also obtained. The base pressure ratio increased with increasing bluntness, increasing Mach number and decreasing Reynolds number. The base heat transfer when correlated in terms of base flow parameters was found to be insensitive to variations in bluntness ratio, Mach number and wall temperature. Also, it was only weakly dependent on Reynolds number. (Author)

AD-614 008 Div. 9, 30
CFSTI Prices: HC$2.00 MF$0.50

Mississippi State Univ., State College.
A DEVICE FOR THE DIRECT MEASUREMENT OF UNSTEADY AIR FLOWS AND SOME CHARACTERISTICS OF BOUNDARY LAYER TRANSITION.
Interim rept.,
by Joseph J. Cornish, III. Mar 65, 26p
Aerophysics research note no. ARN-24
Contract DA44 177AMC892T, Task 1D121401A14203
TRECOM TR-65-12

Unclassified report

Descriptors: (*Gas flow, Flowmeters), (*Flow visualization, Instrumentation), (*Boundary layer transition, Aerodynamic characteristics), Velocity, Stability, Turbulent boundary layer, Photographic techniques, Wire, Circuits, Turbulence.

A device for use in obtaining instantaneous velocity profiles of unsteady air flows is described. The techniques for its use are illustrated by two typical examples in laminar and turbulent boundary layers. (Author)

AD-614 067 Div. 9
CFSTI Prices: HC$3.00 MF$0.75

Colorado State Univ., Fort Collins.
THE VELOCITY FIELD DOWNSTREAM FROM A TWO-DIMENSIONAL MODEL HILL. PART 1.
Final rept. part 1,
by Erich J. Plate and Chi W. Lin. 1964, 81p
CER65EJP14
Grant DA AMC36 039 63G7

Unclassified report

Descriptors: (*Model (Simulations), Fluid mechanics), (*Fluid mechanics, Aerodynamic configurations), Wind tunnel models, Velocity, Pressure, Boundary layer.

The investigation was concerned with two problems. The first problem was that of modeling the flow downstream from a two-dimensional hill in a wind tunnel. It is shown that this is entirely feasible since the momentum equation and the velocity distributions are described by the same set of parameters. Since the modeling ignored essentially the turbulence characteristics, except in as far as they are reflected in the mean flow parameters, it is not clear how diffusion processes would model. This aspect of the problem will be covered most extensively in the continuation of the program. The second problem concerned the prediction of velocity distributions downstream from a two-dimensional hill on the basis of knowledge of the hill geometry and of the undisturbed boundary layer.

AD-614 139 Div. 9

Naval Ordnance Test Station, China Lake, Calif.
CONCERNING AN INTEGRAL OCCURRING IN AEROFOIL THEORY,
by Julius Stekmann. 17 Oct 60, 7p NOTS-TP-2813
NAVWEPS 7813

Unclassified report

Pub. in SIAM Review v3 n3 p243-6 Jul 1961
(Copies available only to DDC users).

Descriptors: (*Airfoils, Integrals), Numerical analysis, Rings.

The calculation of a certain definite integral occurring in the analysis of ring airfoils of elliptic cross section is considered. Although a representation of this integral in

closed form by means of elliptic integral is possible, a solution in the form of a recurrence formula for the purpose of numerical calculation is predicted. (Author)

AD-614 140 Div. 9, 16

Naval Ordnance Test Station, China Lake, Calif.
THEORETICAL STUDIES OF SEA ANIMAL LOCOMOTION. PART I,
by J. Siekmann. 28 Apr 61, 18p NOTS-TP-3028
NAVWEPS 8038 P1

Unclassified report

Pub. in Ingenieur-Archiv v31 n3 p214-28 1962
(Copies available only to DDC users).

Descriptors: (*Fishes, Hydrodynamics), (*Hydrodynamics, Fishes), Swimming, Oscillation, Maneuverability, Two-dimensional flow, Incompressible flow, Boundary layer, Thrust, DG, Functions, Partial differential equations, Integral equations, Bessel functions, Integration, Fourier analysis.

The swimming of a fish is investigated, using as a model a thin, waving plate in two-dimensional, inviscid flow. The solution is essentially an extension of the study of oscillating aerofoils, and is found by replacing the body with a vortex sheet and calculating the flow field. The thrust, lift, required power, and propulsive efficiency are calculated for specific cases and the thrust compared with experimental results.

AD-614 159 Div. 9

Cornell Univ., Ithaca, N. Y.
AN ESTIMATION LEMMA FOR LAMINAR COMPRESSIBLE BOUNDARY-LAYER VELOCITY PROFILES.
Technical notes,
by K. P. Kerney. 23 Jul 64, 2p
Contract AF49 638 1346

Unclassified report

Pub. in AIAA Journal p160-1 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Laminar boundary layer, Velocity), Compressible flow, Two-dimensional flow, Equations, Momentum, Energy, Temperature.

The report describes the use of the solution of a related incompressible problem to estimate the solution of the momentum equation of the original compressible problem. The fluid considered is an ideal gas, the viscosity of which is directly proportional to its temperature.

AD-614 230 Div. 9, 25
CFSTI Prices: HC$5.00 MF$1.25

Fluid Dynamics Research Lab., Mass. Inst. of Tech., Cambridge.
MOLECULAR BEAM VELOCITY DISTRIBUTION MEASUREMENTS,
by Paul B. Scott. Feb 65, 182p
Laboratory rept. no. 65-1
Contract Nonr396303; Grant AF AFOSR131 63,
ARPA Order 322 63
AFOSR 65-0192

Unclassified report

Descriptors: (*Boundary layer, Scattering), (*Molecular beams, Scattering), (*Velocity, Molecular beams), (*Surfaces, Scattering), Measurement, Gases, Nickel, Argon, Helium, Nitrogen, Fluid mechanics, Drag, Boundary layer, Mathematical analysis, Partial differential equations, Test equipment, Wiring diagrams, Test methods.

The energy accommodation of molecules during reflection from a solid surface can be measured as a function of angle of incidence, reflection angle, and incident velocity by molecular beam methods described in the report. The velocity distribution of the rebounding beam of molecules is measured, and compared to the velocity distribution of the incident molecular beam. The measurement is made by the time of flight method. A rotating thin disc with a notched edge acts as a shutter to allow a molecular beam to pass only for a short period. The molecular beam density at a distance L downstream of the shutter is sensed by electron beam ionization and ion collection. It is shown that the thermodynamic fluctuation effect limits the signal resolution of the instrument. Preliminary measurements of the incident molecular time of flight distributions show agreement with the Maxwellian theory in the case of a helium beam, and a deficiency of low velocity molecules for nitrogen and argon beams. Preliminary reflected beam measurements using a polycrystalline nickel surface show that at high target temperatures the thermal accommodation coefficient of air is 0.68 and of helium is 0.06.

AD-614 237 Div. 9
CFSTI Prices: HC$4.00 MF$1.00

Naval Postgraduate School, Monterey, Calif.
SKIN FRICTION DRAG AND SHEAR STRESS DISTRIBUTION ON SEVERAL STREAMLINED BODIES OF REVOLUTION WITH VARIED FINENESS RATIO.
Master's thesis,
by Cleveland L. Dunning, Robert F. Overmyer, and Colben K. Sime, Jr. 1964, 139p

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Bodies of revolution, Drag), (*Drag, Bodies of revolution), Incompressible flow, Friction, Turbulence, Shear stresses, Laminar flow, Pressure, Reynolds number, Graphics, Reentry vehicles, Distribution.

Experimental techniques were employed to determine the coefficient of skin friction drag and the distribution of local frictional intensity for several low drag bodies of revolution with mixed laminar and turbulent flow. The data were obtained as a function of fineness ratio and Reynolds number from experiments conducted in a subsonic wind tunnel under conditions equivalent to incompressible flow. Skin friction drag coefficients were determined first by the indirect method of subtracting pressure drag from total drag. A second more direct method was the determination of local shear distributions and integration over the surface area to obtain total frictional drag. The possibility of inaccuracies introduced by assumptions and agreement between results of the two methods are discussed. (Author)

AD-614 311 Div. 9

Syracuse Univ., N. Y.
INTERACTION OF A STARTING VORTEX AS WELL AS A VORTEX STREET WITH A TRAVELING SHOCK WAVE. Revised ed.,
by Darshan S. Dosanjh and Thomas M. Weeks. 26 Aug 64, 8p
Grant DA ARO D31 124G210
AROD 3242:2

Unclassified report

Pub. in AIAA Journal v3 n2 p216-23 Feb 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Airfoils, Shock waves), (*Vortices, Shock waves), (*Shock waves, Vortices), Acoustics, Turbulence, Two-dimensional flow, Shock tubes, Aerodynamic characteristics, Schlieren photography, Interferometers, Viscosity, Angle of attack.

The passage of a shock front and the associated drift flow over a two-dimensional airfoil, at an angle of attack mounted in a shock tube, generated a columnar spiral starting vortex that interacted with the normal reflected shock. The generation of a progressive cylindrical acoustic wave front centered on the transmitted vortex and its alternate compression-rarefaction nature was experimentally verified and deviations from the predicted pressure amplitude distribution were discovered. A semiempirical relation for the wave-front pressure-amplitude distribution (expressed as a linear combination of quadrupole, dipole, and monopole acoustic sources) was found to represent closely the experimental results. The time variation of the core density of the transmitted vortex was deduced. The spiral vortex decayed essentially as a circular, incompressible viscous vortex until a neighboring high-density region appeared and the vortex decayed at a faster rate. The interaction of the reflected shock with the vortex street generated behind a circular cylinder, resulted in an abrupt change in vortex spacing and rapid dissolution of the vortex street. No well-defined acoustic wave fronts were evident behind the reflected shock front. (Author)

AD-614 389 Div. 9
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
USE OF SHADOWGRAPH MEASUREMENTS FOR QUALITATIVE RESEARCH OF A SUPERSONIC FLOW AROUND A WING PROFILE,
by L. A. Vasil'ev and V. P. Minina. 1 Apr 65, 12p FTD-TT-64-1064
TT 65-62065

Unclassified report

Unedited rough draft trans. of Zhurnal Nauchnoi i Prikladnoi Fotografii i Kinematografii (USSR) v8 n5 p337-42 1963.

Descriptors: (*Flow visualization, Spark shadowgraph photography), (*Supersonic flow, Wings), (*Spark shadowgraph photography, Supersonic flow), USSR, Density.

The work showed that the shadow method of the slit and the filament in the focus can be successfully applied to the investigation of the flow around models of a supersonic current with a figure for the angles of inclination of about 0.0003 of a radian and sufficiently large dimensions of the model. The distribution of the density obtained by this method corresponds well with the theoretical and enables one to take into account the peculiarities which arise from the deviations of the conditions of the experiment from the ideal ones. The investigations also showed the limitations of the given method. (Author)

AD-614 429 Div. 9, 15
CFSTI Prices: HC$3.00 MF$0.75

Naval Weapons Lab., Dahlgren, Va.
SOME RECENT DEVELOPMENTS IN THE THEORY OF VISCOUS FLUID FLOW WITH TECHNOLOGICAL AND GEOPHYSICAL APPLICATIONS,
by Ernst W. Schwiderski and Hans J. Lugt. Apr 65, 70p Rept. no. NWL-1963
Task R360FR103 2101R0110101

Unclassified report

Descriptors: (*Fluid flow, Mathematical analysis), (*Partial differential equations, Fluid mechanics), (*Numerical methods and procedures, Fluid mechanics), Viscosity, Incompressible flow, Boundary layer, Stagnation, Wake, Vortices, Integration, Integral equations, Bibliographies, Geophysics.

Three general mathematical techniques, which have recently been introduced by the authors for systematic solution of the Navier-Stokes equations of incompressible viscous fluid flow, are briefly reviewed. In particular, the applications of these methods to various fundamental flow problems of theoretical and technological interest are highlighted and analyzed with respect to the major physical features of realistic small-scale and large-scale fluid motions. A complete bibliography of all original papers published or in publication, which contain all detailed derivations and results, is given at the end of this report. (Author)

AD-614 444 Div. 9
CFSTI Prices: HC$6.00 MF$1.25

Grumman Aircraft Engineering Corp., Bethpage, N. Y.
A CONICAL THIN-SHOCK-LAYER THEORY UNIFORMLY VALID IN THE ENTROPY LAYER,
by Robert E. Melnik. Jan 65, 233p
Contract AF33 657 7313, Proj. 8219, Task 821902
FDL TDR-64-82

Unclassified report

Descriptors: (*Shock waves, Theory), (*Conical bodies, Hypersonic flow), (*Hypersonic flow, Conical bodies), Entropy, Mathematical analysis, Nonlinear differential equations, Series.

This paper is concerned with the thin-shock-layer theory of hypersonic flow over general conical surfaces. A small parameter, E, representative of the density ratio across the shock wave is introduced and systematic expansions of the exact nonlinear equations of conical flow are constructed. By combining the method of 'inner and outer expansions' with the 'P.L.K.' method the author obtains a two layer solution and the associated composite expansion that is uniformly valid in the entropy layer. Formulas for the first two terms of the various expansions are given in terms of a number of quadratures. The discontinuities of entropy, density, and radial velocity appearing in the limit solution are replaced by regions of rapid variation in the uniformly valid solution. To illustrate the general character of the entropy layer corrections, the first order terms of the expansions were evaluated for two specific cases: the hypersonic flow over a slightly yawed circular cone, and the hypersonic flow in the vicinity of a conical symmetry plane. In both cases all integrations were carried out analytically and explicit solutions were obtained. For the case of a circular cone the present theory reproduced the first order results obtained by Cheng in an earlier analysis. (Author)

AD-614 457 Div. 9, 4
CFSTI Prices: HC$2.00 MF$0.50

Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
TECHNIQUES FOR SOLVING NONEQUILIBRIUM EXPANDING FLOW PROBLEMS.
Interim rept.,
by Robert E. Mates and John A. Lordi. Jan 65, 40p
Contract AF33 657 8860, Proj. 7065, Task 706507
ARL 65-2

Unclassified report

Descriptors: (*Nonequilibrium flow, Numerical analysis),

(*Numerical analysis, Nonequilibrium flow), Gas flow, Kinetic theory, Equations of state, Nozzle gas flow, Perturbation theory, Nonlinear differential equations, Integration.

Methods of solving the problem of expanding nonequilibrium flows have been under development at CAL for some time. The extension of the calculations to higher temperatures and pressures has necessitated improvements in the calculation methods. This report summarizes those techniques used at CAL which have not been previously discussed and includes the recent modifications. Numerical solutions for nonequilibrium expansions of high enthalpy airflows are presented in AD-610 820. The solution of nonequilibrium nozzle flows involves the numerical integration of a set of nonlinear ordinary differential equations. Difficulties are encountered in starting the solution since the flow is initially in equilibrium. The starting technique used at CAL is based on a perturbation about the equilibrium solution. Several possible perturbation methods are discussed and compared. A method is presented for mixing the equilibrium and nonequilibrium equations which is useful for systems involving widely different reaction rates. Improvements in the numerical integration technique, including the application of a recent modification of the Runge-Kutta method, are discussed. These improvements reduce oscillations in the solutions and reduce computing time. It is shown that substantial reductions in computing time are made possible by starting the solution as far downstream as possible. The solutions obtained do not depend on the starting point. (Author)

AD-614 492 Div. 9

Harvard Univ., Cambridge, Mass. Div. of Engineering and Applied Physics.
THE VISCOUS INCOMPRESSIBLE FLOW INSIDE A CONE,
by Robert C. Ackerberg. 20 Apr 64, 38p
Grant AF AFOSR1 63, Proj. 9781, Task 9781 01
AFOSR 65-0557

Unclassified report

(Copies available only to DDC users).

10. Fuels and Combustion

AD-614 133 Div. 10, 16
CFSTI Prices: HC$3.00 MF$0.75

Melpar, Inc., Falls Church, Va.
COMPREHENSIVE BIBLIOGRAPHY FOR MECHANISM OF MICROBIOLOGICAL CONTAMINATION OF JET FUEL AND DEVELOPMENT OF TECHNIQUES FOR DETECTION OF MICROBIOLOGICAL CONTAMINATION, APPENDIX C.
Quarterly progress rept. no. 2, app., 1 Jun-1 Sep 63, by Gordon C. Blanchard. 1 Sep 63, 93p
Contract AF33 657 9186

Unclassified report

Descriptors: (*Fuel contamination, Bibliographies), (*Jet engine fuels, Biological contamination), Microorganisms, Bacteria, Pseudomonas, Corrosion, Corrosion inhibition, Polymers, Lubricants, Degradation, Purification, Hydrocarbons, Fuel additives, Oxidation, Elastomers, Aromatic compounds, Petroleum, Fuel tanks.

AD-614 484 Div. 10, 14, 25, 30
CFSTI Prices: HC$4.00 MF$1.00

Firestone Flight Sciences Lab., Calif. Inst. of Tech., Pasadena.
SOLID ROCKET STRUCTURAL INTEGRITY ABSTRACTS. VOLUME II, NO. 2,
ed. by R. A. Westmann. Apr 65, 125p
Contract AF04 611 9572, Proj. 3059

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.
See also AD-612 261.

Descriptors: (*Solid rocket propellants, Physical properties), Reviews, Abstracting, Elastomers, Mathematical analysis, Mechanical properties, Viscoelasticity, Stresses, Structures, Test methods, Failure mechanics, Thermal properties, Differential equations, Integral equations, Optical properties.

Contents:
A summary of linear viscoelastic stress analysis by Harry H. Hilton
Mechanical characterization
Thermal characterization
Optical characterization
Special test procedures
Physico-chemical effects on mechanical behavior.
Analytical methods
Failure

AD-614 563 Div. 10, 17
CFSTI Prices: HC$3.00 MF$0.50

Aeronutronic, Newport Beach, Calif.
ESTIMATING METAL PARTICLE COMBUSTION KINETICS,
by R. W. Bartlett, J. N. Ong, Jr., W. M. Fassell, Jr., and C. A. Papp. 2 Jul 62, 52p Pub. no. U-1751
Contract NOw61 0905c

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Combustion, Powder metals), (*Aluminum, Combustion), (*Beryllium, Combustion), (*Magnesium, Combustion), Particles, Oxidation, Burning rate, Ignition, Thermal conductivity, Oxides, Barometric pressure, Heat of fusion, Flames, Mathematical models, Reaction kinetics.

A combustion model for metal particles is derived and compared with experimental results for a few metals with high combustion enthalpies. It is concluded that aluminum and beryllium oxidize slowly because of formation of solid oxide films which impede the transport of reactants at temperatures below their oxide melting points. Diffusion through the liquid oxides is several decades faster, causing ignition to occur at the oxide melting point. After ignition, the temperature rises rapidly. When the metal boiling point is reached, metal evaporation expands the liquid oxide shell until the evaporation rate and rate of diffusion of reactant through the oxide shell are equal. The oxidation reaction occurs at the oxide shell rather than the metal interface and proceeds by this mechanism until the particle is consumed. Expansion of this shell accounts for the prevalence of hollow oxide spheres observed in the quenched combustion products. Calculations of the elapsed times for each stage in the combustion sequence were machine computed. Inadequate knowledge about diffusion coefficients in liquid oxides is the principal uncertainty involved. The diffusion flame theory adequately accounts for the combustion of magnesium. (Author)

11. Ground Transportation Equipment

No entries

12. Guided Missiles

AD-613 958 Div. 12, 1
CFSTI Prices: HC$1.00 MF$0.50

Lockheed Missiles and Space Co., Sunnyvale, Calif.
A PILOT DISPLAY CONCEPT FOR NEAR-TARGET MANEUVERS DURING RENDEZVOUS,
by D. W. Eliason and D. H. Utter. 1 Mar 65, 32p
Rept. no. 6-65-65-3

Unclassified report

Descriptors: (*Rendezvous guidance, Display systems), (*Display systems, Rendezvous spacecraft), (*Space flight, Rendezvous guidance), Spacecraft docking, Space maintenance, Flight control systems, Instrument panels, Cathode ray tube screens, Astronautics, Thrust vector control systems.

A preliminary investigation was carried out for a translational control system concept for near-target maneuvers during rendezvous. The maneuvers are applicable to such missions as docking, inspection, and the Air Force Remote Maneuvering Unit. The concept consists of: (1) a small constant thrust acceleration directed at the target by the maneuvering vehicle, (2) a phase-plane CRT representation of radar range and range rate with superimposed overlay contours, and (3) a means for determining the appropriate scale factors for the phase-plane display in the general case. Translation is effected by suitable combinations of thrusting and non-thrusting periods. A pilot task description is given for a typical range change maneuver. (Author)

AD-614 002 Div. 12, 5
CFSTI Prices: HC$1.00 MF$0.50

Aerospace Corp., Los Angeles, Calif.
SATELLITE CONTROL FACILITY, DESIGN CRITERIA: DIRECT CONNECTION FOR CDC-160A COMPUTER TO TELETYPE TRANSMISSION LINES,
by H. E. Pallett. 28 Feb 64, 18p
Rept. no. TOR-269(4110-01)-30
Contract AF04 695 269

Unclassified report

Descriptors: (*Teletype systems, Digital computers), (*Digital computers, Data transmission systems), (*Data transmission systems, Teletype systems), (*Satellites (Artificial), Tracking), Communication theory, Systems engineering, Reliability (Electronics), Specifications, Ground support equipment, Space communication systems, Command and control systems.

This document establishes the design criteria for the CDC-160A Computer interconnection to the 60/100 word-per-minute (wpm) teletype data lines. This interconnection equipment shall interface with the CDC-160A Computer and the teletype transmission lines, including the equipment used with the teletype lines which is necessary for encryption. (Author)

AD-614 003 Div. 12, 5

Aerospace Corp., Los Angeles, Calif.
SATELLITE CONTROL FACILITY, DESIGN CRITERIA: EXTENDING THE FREQUENCY RESPONSE OF THE REMOTE STATION TAPE RECORDER/REPRODUCER EQUIPMENT,
by W. C. Hazel. 20 Feb 64, 14p Rept. no. TOR-269(4110-01)-39
Contract AF04 695 269

Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.
See also AD-614 002.

Descriptors: (*Magnetic recording systems, Telemeter systems), (*Telemeter systems, Magnetic recording systems), (*Satellites (Artificial), Tracking), Ground support equipment, Communication equipment, Systems engineering, Space communication systems, Command and control systems, Reliability (Electronics), Specifications.

This document establishes the design criteria for extending the frequency response of the tape recorder/reproducer equipment at the remote tracking stations of the Satellite Control Facility (SCF). This recording equipment is part of the FM/FM Telemetry Ground Station that is being added to the SCF remote tracking stations under the Multiple Satellite Augmentation Program (MSAP). (Author)

AD-614 402 Div. 12
CFSTI Prices: HC$2.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
INVESTIGATIONS OF RADIATIONS ON MAN-MADE EARTH SATELLITE COSMOS-17,
by S. N. Vernov and A. E. Chudakov. 16 Apr 65, 29p
FTD-TT-65-263
TT 65-62058

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR, Izvestiya. Seriya Fizicheskaya v28 n12 p2058-74 1964.

Descriptors: (*Satellites (Artificial), Cosmic rays), (*Cosmic rays, Radiation measurement systems), Nuclear particles, Space environmental conditions, Scintillation counters, Photomultipliers, Instrumentation, Electrons, Protons, USSR, Experimental data, Van Allen radiation belt.

The man-made earth satellite COSMOS-17, launched into orbit on May 22, 1963, carried on board an apparatus, intended for studying the radiation belts, of the Earth and primary cosmic radiation. The orbital parameters of the satellite, were as follows: altitude in apogee - 788 km, altitude in perigee - 260 km, angle of orbital plane inclination to the plane of the equator - 49 degrees, period of rotation - 94.8 km minutes. The reports contains data collected by COSMOS-17 and a discription of instrumentation.

AD-614 410 Div. 12, 30
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
GROWTH OF AUTOMATION IN PRELAUNCH CHECKOUT FOR SPACE VEHICLES,
by Larry T. Mast. Apr 65, 13p Rept. no. P-3111

Unclassified report

For presentation at an Institute of Electrical and Electronics Engineers technical conference to be held in St. Louis, Mo., 7-9 Jun 65.

Descriptors: (*Checkout procedures, Automation), (*Space vehicles, Checkout procedures), Programming (Computers), Data processing systems, Telemeter systems, Communication systems, Fuel systems, Display systems, Quality control, Management planning.

Increased automation or mechanization in the factory-to-launch space vehicle preparation sequence can be expected to reduce test data reduction times, improve control, and reduce hold times. All of these lead to a better coordinated, more effective system to do a higher quality job. The report outlines the potential for this automation growth. (Author)

13. Installations and Construction

AD-613 940 Div. 13, 31
CFSTI Prices: HC$2.50 MF$0.75

Naval Civil Engineering Lab., Port Hueneme, Calif.
A STUDY OF EFFECTIVE FENDER SYSTEMS FOR NAVY PIERS AND WHARVES.
Final rept. for 1 Jul-20 Sep 64,
by T. T. Lee. Mar 65, 114p Technical rept. R-312
Proj. Y F015 10 03 309

Unclassified report

Descriptors: (*Piers, Naval shore establishments), Marine safety equipment, Cost, Design, Floats, Rubber, Wood, Harbors, Mooring.

A research and field study leads to the conclusion that, for berthing ships up to 20,000 tons displacement, the best fender systems for Navy docks are (1) a modified retractable system for sheltered harbors; (2) standard greenheart pile with rubber bearing block at deck level for unsheltered harbors; and (3) the Raykin (rubber-in-shear) system for dock corners generally. It is recommended (1) that resilient floating fenders be used for berthing large vessels; (2) that the Laboratory's newly proposed HYNEU or HYFOAM fender (two rubber bags, one inside the other, the outer filled with water, the inner filled with air or foam) be considered for use in either protected or exposed harbors; (3) that prototype installations of three proposed fender systems (for which specifications are given) be tested; and (4) that a study be made of incorporating bow-propeller units in newly constructed ships for greater control in berthing. (Author)

AD-613 987 Div. 13, 22
CFSTI Prices: HC$3.00 MF$0.75

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
CALCULATION OF CHARGES DURING MASSIVE EXPLOSIONS FOR THROWING-OUT, 2 ED. REV,
by G. I. Pokrovskii and A. A. Chernigovskii.
29 Jan 65, 93p FTD-MT-64-253
TT 65-61985

Unclassified report

Edited machine trans. of mono. Raschet Zaryadov pri Massovykh Vzryvakh na Vybros, 2 ed rev, Moscow, 88p 1962.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available from public sale.

Descriptors: (*Underground explosions, Civil engineering), Cratering, Ballistics, Tables, USSR, Explosion effects, Equations, Ejection, Rock (Geology).

Contents:
Mass explosions for throwing-out in contemporary conditions
Feature of explosion for ejection with a large 1.1.r
Calculation of charges for ejection
Calculation of dimensions of funnel
Consumption of explosives and efficiency during explosion on ejection
Definition of distance of scattering of earth
Definition of thickness of pile
Transition from concentrated to elongated charges
About location of big charges in rock
Seismic action of explosion
Ballistic table
Literature.

AD-614 072 Div. 13, 25
CFSTI Prices: HC$1.00 MF$0.50

Polytechnic Inst. of Brooklyn, N. Y.
A NOTE ON VIBRATIONS OF A BEAM ON AN ELASTIC FOUNDATION,
by Morris Morduchow. Mar 65, 15p
Rept. no. PIBAL-901
Contract Nonr83917FBM, Proj. NR064 427

Unclassified report

Descriptors: (*Beams (Structural), Vibration), Foundations (Structures), Elasticity, Frequency, Deformation, Loading (Mechanics), Numerical analysis, Differential equations, Damping.

For cases in which the foundation modulus varies proportionately to the mass per unit length of the beam, the principal mode shapes of the free bending vibrations of a non-uniform beam will be exactly the same as without the elastic foundation, and a simple exact result for the effect of the foundation on the natural bending frequency in any mode is obtained. Extensions of the analysis and results for such cases are then made to obtain the exact effect of the elastic foundation on torsional vibrations and on bending vibrations with damping and axial end loads. A general solution for forced bending vibrations is shown. When the foundation modulus does not vary exactly proportionately to the mass per unit length of the beam, a simple approximate result for the effect of the elastic foundation on the natural bending frequency in any mode is obtained by the Rayleigh method. (Author)

AD-614 108 Div. 13, 2, 25, 30
CFSTI Prices: HC$3.00 MF$0.75

New Mexico Univ., Albuquerque. Air Force Shock Tube Facility.
EFFECTS OF BOUNDARY FRICTION ON TRANSMISSION OF STATIC STRESS THROUGH AND IN CYLINDRICAL TANKS.
Technical rept. for Sep 63-Feb 64,
by Phillip A. Abbott. Mar 65, 54p
Contract AF29 601 6002, Proj. 5710, Task 13 148
WL TR-64-108

Unclassified report

Descriptors: (*Soil mechanics, Load distribution), Stresses, Sand, Tanks, Boundary value problems, Friction, Statics, Loading (Mechanics), Test equipment.

Experiments to determine the effects of boundary friction on the transmission of static vertical stress through standard 20-30 Ottawa sand in 8-inch I. D. tanks are discussed. In these experiments the tank type, tank height, applied overpressure, sand density, and boundary treatment were varied. Theory and derived values for the coefficient of wall friction are included. Tests showed that the transmission did not vary significantly with overpressure between 1/2 and 6 kg/sq cm (7.11 and 85.32 psi), but decreased as the height of the tank increased. The decrease in transmission with increase in tank height could be approximated by the theoretical equation up to some maximum height. It is concluded that a greased membrane is perhaps the simplest and certainly an adequate means of reducing wall friction to such levels that no correction in the free-field average vertical stress over small areas in the center of the tank should be required. This could be said of a tank with a height even as great as three times its diameter. (Author)

AD-614 259 Div. 13, 17
CFSTI Prices: HC$2.00 MF$0.50

Naval Civil Engineering Lab., Port Hueneme, Calif.

A SURVEY OF PIPE CORROSION AT NAVAL ACTIVITIES.
Final rept. for Nov 62-Oct 64,
by John M. Stephenson. 26 Mar 65, 35p
Technical note N-700
Proj. Y R007 08 01 004

Unclassified report

Descriptors: (*Pipes, Corrosion), (*Corrosion, Pipes), (*Naval shore establishments, Pipes), Corrosion inhibition, Coatings, Civil engineering, Materials.

To determine the effectiveness of methods used in the field to protect pipeline systems from corrosion within a group of government activities, engineers from the U. S. Naval Civil Engineering Laboratory made on-site investigations of piping distribution systems in a total of twenty-three Naval activities located in various places of the Pacific coast, Atlantic coast, gulf coast, Hawaii and Inland California. The data collected from the sites were more commonly from service pipelines such as steam, hot water, potable water, sea water, sewage, air, gas and oil. One hundred and six pipe installations were investigated. Information as to site, soil characteristics, type of coating or covering, date of installation, length of pipe involved, and reports on the success or failure of the systems are recorded in tabular form and entered in Appendixes A and B. The most serious failures reported are in underground hot pipeline systems where, in most cases, the lines are installed below the water table. (Author)

AD-614 418 Div. 13, 9, 25
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
THE EFFECTS OF FLUID RESONANCE ON THE BOUNDARY STRESSES OF A FLUID-FILLED CAVITY,
by C. C. Mow and J. W. Workman. Apr 65, 40p
Rept. no. RM-4453-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Underground structures, Hydraulic accumulators), (*Fluid mechanics, Underground structures), (*Shock (Mechanics), Hydraulic accumulators), Compressible flow, Resonance, Stresses, Numerical analysis.

The problem treated in this memorandum is the determination of the dynamic stresses at the boundary of a cavity filled with an inviscid compressible fluid during the passage of a plane dilatational wave train. The steady-state response or admittance function is obtained for a circular cavity of infinite extent. It is found that at critical frequencies the intensity of the boundary stresses can be significantly higher than that predicted under static loading. It is shown that the high intensities are due to resonance in the fluid and that the resonance conditions can be predicted once the properties of the medium and the fluid are known. Computations are presented for a case representing a water-filled, 20-ft-diameter cavity in rock. The lowest frequency at which resonance occurs lies above 100 cps in this case. It is indicated that the transient response to an aperiodic disturbance could be obtained through the use of a Fourier convolution. (Author)

AD-614 430 Div. 13, 2
CFSTI Prices: HC$2.00 MF$0.50

Army Cold Regions Research and Engineering Lab., Hanover, N. H.
AGE HARDENING OF SNOW AT THE SOUTH POLE,
by Anthony J. Gow and Rene O. Ramseier.
Nov 64, 32p Research rept. no. RR-112
Task 8X99 27 001 03 Unclassified report

Descriptors: (*Snow, Aging (Materials)), (*Aging (Materials), Snow), Hardening, Compressive properties, Buildings, Construction, Materials, Phase studies, Polar regions, Civil engineering.

The age hardening of artificially and naturally compacted snow has been investigated at the South Pole. Results show that the age-hardening process is greatly retarded at low temperatures. Artificially compacted samples of density 0.55 g/cc attained a compressive strength of less than 3.0 kg/sq cm after one year's aging at -49C. Exposure to solar radiation accelerated the age hardening. Irradiated samples attained a strength of 6.0 kg/sq cm after 100 hr, increasing to a virtual maximum of 8.0 kg/sq cm at 600 hr. Compressive strengths increased with a decrease in snow-particle size and with an increasing angularity of the particles. Below 3 m the strength of naturally compacted snow was found to increase rapidly with an increase in density. Naturally compacted snow of density 0.55 g/cc possessed considerably greater strength than any of the age-hardened samples of artificially compacted snow of the same density. Thin-section studies show that age hardening can be correlated with the formation and growth of intergranular bonds, and that bond growth falls off rapidly with decreasing temperature. In view of the low strength found in both naturally and artificially compacted snow at the South Pole, 'cut-and-cover' undersnow camp construction may not prove practical at the South Pole. (Author)

AD-614 481 Div. 13, 2
CFSTI Prices: HC$6.00 MF$1.25

Illinois Univ., Urbana.
A STUDY OF THE BEHAVIOR OF SOIL AND ROCK SUBJECTED TO HIGH STRESS LEVELS.
Final rept. for Mar 63-May 64,
by H. Kane, A. H. Hendron, E. W. Brooker, and B. Mohraz. Mar 65, 202p
Contract AF29 601 5817, Proj. 5710, Task 13 144
WL TR-64-157

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Soil mechanics, Compressive properties), (*Sand, Compressive properties), (*Clay, Compressive properties), Spheres, Rock (Geology), Stresses, Strain (Mechanics), Elasticity, Loading (Mechanics), Failure (Mechanics), Civil engineering, Engineering geology, Underground structures.

An analytical and experimental investigation has been conducted to study the behavior of sand and clay under high stresses. The analytical work developed equations for the stress-strain properties of a medium composed of elastic equi-radii spheres in a face-centered cubic array. Theoretical relationships between the coefficient of earth pressure at rest, the angle of internal friction, and the coefficient of friction between the spheres were also derived. A special zero-lateral-strain device was developed for one-dimensional compression tests on sand and clay. The tests were carried to axial stresses of 3300 psi on four sands and 2200 psi on five remolded clays. The tests on sand demonstrated that the grain shape and gradation were as important as relative density in influencing the stress-strain properties. Controlled radial strain tests on the sand, with axial stresses up to 5000 psi, disclosed a failure envelope with a significant decrease in slope under the high pressures. Unloading of the sands and clays caused the coefficient of earth pressure at rest to increase and approach the coefficient of passive earth pressure. (Author)

AD-614 488 Div. 13, 18, 20

Forest Service, Washington, D. C.
PROBABILITY OF EFFECTIVE POST-ATTACK FIRE FIGHTING IN WILDLANDS,
by Craig C. Chandler and Mark J. Schroeder.
Mar 65, 11p Research rept. no. RR-10
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Forest fires, Nuclear warfare), (*Nuclear warfare, Forest fires), (*Thermal radiation, Forest fires), Fire safety, Nuclear explosions, Ignition, Burning rate, Damage, Control systems, Probability, Civil defense systems.

In the event of nuclear attack, thermal radiation from nuclear weapons may start fires over large areas of the United States. The potential of such fires to cause material damage and loss of life in cities is obvious. In rural and wildland areas they will destroy crops and other natural resources. They may disrupt communication, power transmission, and transportation networks, and produce sufficient smoke to eliminate visual navigation or reconnaissance capability by aircraft. This paper presents an assessment of the wildland fire threat and suggests the probable effectiveness of conventional fire fighting forces in materially reducing the damage from post-attack fires in wildlands. (Author)

14. Materials (Non-Metallic)

AD-613 936 Div. 14, 4
CFSTI Prices: HC$1.00 MF$0.50

Naval Ordnance Lab., White Oak, Md.
NEW ARYLOXY ALKOXYSILANES (I).
Progress rept. for Jan-Jun 64,
by James V. Duffy and Porter W. Erickson.
26 Jan 65, 22p NOLTR-64-204
Task 732SP004

Unclassified report

Descriptors: (*Glass textiles, Finishes and finishing), (*Finishes and finishings, Silanes), (*Silanes, Synthesis (Chemistry)), Condensation reactions, Resorcinol, Esters, Alkenes, Alcohols, Amines.

A total of ten new aryloxy alkoxysilanes were synthesized that are potential glass fiber finish chemicals for several resin systems. These aryloxysilanes were prepared by the partial condensation reaction between resorcinol and the following silanes: B(3,4-epoxycyclohexyl)ethyltrimethoxysilane, gamma -glycidoxypropyltrimethoxysilane, N,N bis(beta-hydroxyethyl)-gamma -aminopropyltriethoxysilane, gamma - aminopropyltriethoxysilane, gamma -carbethoxyethyltriethoxysilane, vinyltriethoxysilane, vinyl-tris (gamma -methoxyethoxy) silane, gamma -methacryloxypropyltrimethoxysilane, 3-cyclohexentriethoxysilance and allyltriethoxysilane. (Author)

AD-613 997 Div. 14, 31
CFSTI Prices: HC$1.00 MF$0.50

Narmco Research and Development Div.,
Whittaker Corp., San Diego, Calif.
INTERLAMINAR SHEAR OF FILAMENT-WOUND REINFORCED PLASTICS.
Quarterly progress rept. no. 6, 1 Jan-31 Mar 65,
by Jim Keogh. Apr 65, 15p
Contract N60921 7094

Unclassified report

Descriptors: (*Composite materials, Filament wound construction), (*Filament wound construction, Composite materials), (*Submarine hulls, Filament wound construction), Shear stresses, Reinforcing materials, Plastics, Glass textiles, Cylindrical bodies, Rods, Rings.

The report describes work on a program whose objective is to improve the interlaminar shear strength of filament-wound composites. Efforts expended during this reporting period were directed toward fabrication of fiberglass reinforced plastic cylinders high in interlaminar shear. (Author)

AD-614 059 Div. 14, 4
CFSTI Prices: HC$0.50 MF$0.50

Naval Research Lab., Washington, D. C.
REDUCTION OF POLYMERIC FRICTION BY MINOR CONCENTRATIONS OF PARTIALLY FLUORINATED COMPOUNDS.
Interim rept.,
by R. C. Bowers, N. L. Jarvis, and W. A. Zisman.
1 Mar 65, 17p Rept. no. NRL-6227
Proj. RR007 08 44 5501

Unclassified report

Descriptors: (*Lubricants, Lubricant additives), (*Lubricant additives, Fluorine compounds), Acrylic resins, Polyvinyl chloride, Fluorination, Halocarbon plastics, Surface-active substances, Halogenated hydrocarbons, Friction, Surface tension, Diffusion, Copolymerization, Films, Disks.

A new approach to the reduction of boundary friction in solid polymers was studied. Dry frictional properties of several classes of polymeric solids were reduced significantly by the addition of small proportions of a suitably designed surface-active compound. Appropriate fluorocarbon derivatives were prepared and found effective in polymethyl methacrylate, polyvinyl chloride, and in several polyvinylidene chloride copolymers. These addition agents are effective both in polymer films prepared by evaporation from a solvent and in thick disks prepared from the melt. The low-energy surfaces formed by the fluorinated additives may also be self-healing, that is, any surface-active molecule lost from the film may be replaced by the diffusion of additional material to the interface. The decrease in friction caused by the addition agent is accompanied by an increase in the equilibrium contact angle of each of several liquids on the polymer surface. The small proportion of addition agent used causes only a small decrease in the hardness of the polymers. (Author)

AD-614 076 Div. 14
CFSTI Prices: HC$2.00 MF$0.50

Air Force Materials Lab., Air Force Systems Command, Wright-Patterson AFB, Ohio.
THE INVESTIGATION OF MICROSTRUCTURE IN STRUCTURAL CERAMICS,
by H. M. Burte and L. A. Jacobson. Jan 65, 31p
ML TR-65-10
Proj. 7350, Task 735001

Unclassified report

Presented at the Symposium on Ceramics for Space, Annual Meeting of the American Ceramic Society (66th), Apr 1964.

Descriptors: (*Ceramic materials, Microstructure), Composite materials, Structural properties, Test methods, Mechanical properties, Thermal properties, Chemical properties, Metallography.

The importance of understanding and controlling the effects of microstructure on the properties of ceramics for space and nuclear applications has become well established in recent years, and several introductory reviews are available. It is now appropriate to focus attention on defining pacing problems and the most fertile areas for future effort. This is attempted for the mechanical, thermal, and chemical properties underlying the structural use of ceramics. A dimensional range from subgrain features of polycrystalline bodies to the micromechanics of composites is considered. The status of experimental methods for characterizing microstructure is discussed, as is the importance of improved experimental substances. One pacing factor is the ability to synthesize or prepare desired microstructures with controlled variations, in order to further research into microstructural effects as well as to provide a basis for subsequent technology. (Author)

AD-614 229 Div. 14, 25
CFSTI Prices: HC$2.00 MF$0.50

Aitron, Inc., Morris Plains, N. J.
HYDROTHERMAL GROWTH OF CRYSTALS OF LaAlO3.
Semiannual technical summary rept. for 15 Aug-31 Dec 64, 31 Dec 64, 36p Rept. no. R11-473
Contract Nonr461600, Proj. 4730; ARPA Order 306 62

Unclassified report

Descriptors: (*Ceramic materials, Crystal growth), (*Crystal growth, Lanthanum compounds), (*Lanthanum

compounds, Aluminates), Impurities, Chromium, Transition temperature, High-temperature research, High-pressure research.

LaAlO3 has been successfully grown in a hydrothermal system below and above the transition temperature of 435C. Using small autoclaves, growth has been observed in the temperature range of 400C - 600C in 7 m K2CO3 at 10,000 to 20,000 psi. A high pressure form of La(OH)3 is also stable within this temperature and pressure range. Seed crystals up to 1/4 inches x 1/4 inches x 1/8 inches were grown from PbF2 fluxes. These crystals are readily doped with Cr by the addition of Cr2O3 to the melt. (Author)

AD-614 242 Div. 14
CFSTI Prices: HC$2.00 MF$0.50

Midwest Research Inst., Kansas City, Mo.
FRICTION AND WEAR BEHAVIOR OF SOLID FILMS.
Rept. for 1 Dec 63-31 Dec 64,
by Paul J. Bryant. 1965, 27p
Contract AF33 657 10122, Proj. 7342, Task 734204
ML TR-65-5

Unclassified report

Descriptors: (*Lubricants, Graphite), (*Graphite, Lubrication), (*Films, Graphite), Friction, Wear resistance, Solids, Environmental tests, Shear stresses, Crystal lattice defects, Fracture (Mechanics), Single crystals, Relaxation time.

The research phases consist of: (1) a study of cleavage energies and stress-relaxation effects for graphite in air, vacuum, and pure environments of relevance to lubrication phenomena; (2) measurements of the shear strength of graphite and the physical mode of failure under shearing motion; and (3) a detailed study of friction and wear process, including wear particle size measurements, in the pure relevant environments for graphite lubrication. The first phase has shown, from both theory and experiment, an unusually high binding energy for graphite. This high energy has been identified as the real reason for graphite's failure to exhibit intrinsic lubrication. The second phase has confirmed the conclusions drawn from the first study by showing a high shear strength for graphite. The third phase promises to give correlations between the basic properties of graphite, such as binding energy, and effects which are observed during actual frictional tests. Thus, all of the results from cleavage measurements, stress relaxation in various environments, and shear strength measurements will be correlated with the friction and wear studies to give a better understanding of lamellar solid lubrication. (Author)

AD-614 263 Div. 14, 26
CFSTI Prices: HC$3.00 MF$0.50

Honeywell Research Center, Hopkins, Minn.
FABRICATION AND FRACTURE OF POLYCRYSTALLINE NiO.
Interim technical rept. no. 3,
by W. B. Harrison. Mar 65, 52p
Contract DA11 022ORD3441, Projs. 59901007, TB2 0002
AROD 2884:31

Unclassified report

See also AD-614 265.

Descriptors: (*Nickel compounds, Monoxides), (*Ceramic materials, Fracture (Mechanics)), (*Processing, Ceramic materials), Powders, Sintering, Hot working, Density, Porosity, Heat treatment, Grain boundaries, Microstructure, Stresses.

High purity, sub-micron NiO powders have been obtained by the preparation and pyrolysis of nickel oxalate. The grain growth and densification of these sub-micron particles was studied under various sintering atmospheres and under various hot pressing conditions. Sintering produced 6-17 micron NiO with a density as high as 96% of its theoretical x-ray density of 6.805 gm/cc. Such material in the as-machine state had a zero transverse strength of 23,700 psi. Localized concentrations of grain boundary porosity appeared to be the source of failure in sintered NiO. Hot pressing produced 2 micron NiO with less than 2% porosity. When a closed pore state was reached at about 3.5% porosity, gases were entrapped within the NiO which expanded and apparently introduced grain boundary microcracks into the NiO structure. Such material fractured at stresses as low as 5,000 psi. at room temperature. The heat treatment of such material removed these stresses and increased its strength to as high as 18,300 psi. Mechanical polishing increased the room temperature strength to 23,000 psi. and its 650C strength to 24,400 psi. No evidence for a rhomberhedral transformation in this fine grained, polycrystalline NiO was observed. (Author)

AD-614 265 Div. 14
CFSTI Prices: HC$1.00 MF$0.50

Honeywell Research Center, Hopkins, Minn.
MECHANICAL BEHAVIOR OF POLYCRYSTALLINE CERAMICS.
Final rept.,
by W. B. Harrison. Apr 65, 16p
Contract DA11 022ORD3441, Projs. 59901007, TB2 0002
AROD 2884:4

Unclassified report

Descriptors: (*Ceramic materials, Mechanical properties), Magnesium compounds, Monoxides, Nickel compounds, Titanium compounds, Carbides, Powders, Sintering, Hot working, Fracture (Mechanics), Ductility, Density, Electrical properties, Crystals, Microstructure, Surface properties, Crystal lattice defects, Impurities.

The fabrication of high density, high purity, fine grained polycrystalline MgO, NiO, and TiC ceramics from micron and sub-micron powders by sintering and hot pressing techniques is discussed. The influence of pore size, pore location, grain size, surface damage, grain boundary condition, and certain impurities on the room temperature fracture behavior of these cubic materials is summarized. Fracture behavior studies on chemically polished, polycrystalline MgO were made to 1200C for various types of microstructures. Some ductility in certain high density MgO structures was observed at temperatures as low as 800C and progressively more ductility occurred at the higher temperatures. Certain electrical behavior in NiO and TiC was studied and, in the case of TiC, a preliminary correlated with mechanical behavior was made. (Author)

AD-614 274 Div. 14, 8
CFSTI Prices: HC$3.00 MF$0.75

Raytheon Co., Waltham, Mass. Research Div.
MICROWAVE NONLINEAR DIELECTRIC MATERIALS.
Rept. no. 16 (final) for 15 Sep 63-14 Oct 64,
by M. Harris, J. S. Waugh, A. Paladino, and P. B. Nutter.
14 Oct 64, 73p Rept. no. S-694
Contract DA36 039AMC03389E, Proj. 1C024401A112,
Task 1C024401A11203

Unclassified report

Continuation of Contract DA36 039sc89126.

Descriptors: (*Dielectrics, Materials), (*Ceramic materials, Dielectric properties), (*Microwave equipment, Dielectrics), Microwave frequency, X band, Barium compounds, Strontium compounds, Titanates, Impurities, Aluminates, Oxides, Stannates, Lanthanum, Lanthanum compounds, Transition temperature, Heat treatment, Hot working.

Microwave nonlinearity and loss tangent data for alumina and stannate-doped (Ba0.5,Sr0.5)TiO3 (BST-50) near the Curie temperature are presented. A hot-pressed, annealed sample is included among the above materials. Similar data on alumina- and lanthana-doped (Ba0.7,Sr0.3)TiO3 (BST-70), including a hot-pressed, annealed sample are presented. No unusual behavior was observed, and it is concluded that hot-pressing and annealing do little to improve the behavior of mixed titanate ceramics near the Curie temperature. A BaTiO3 ceramic doped with two mole percent of lanthana (La2O3) exhibited an extrapolated Curie temperature of +30C. Its nonlinearity and loss at the Curie peak were both comparable to those of BST-50 or BST-70. Lanthanum additions to SrTiO3 depressed the Curie temperature by an amount of 30-40C/mole percent lanthanum. The frequency dependence of the loss tangent of BST-50, BST-70, and lanthana-doped BaTiO3 is seen to deviate strongly from linear dependence near the Curie temperature. The frequency ranges used were 2-4 Gc/sec and 8-12 Gc/sec. (Author)

AD-614 278 Div. 14, 4, 26
CFSTI Prices: HC$2.00 MF$0.50

Redstone Scientific Information Center, Redstone Arsenal, Ala.
SOME NEW FREEZE PHOTOELASTIC MATERIALS AND THEIR APPLICATION,
by Katsuhiko Ito. Mar 65, 29p RSIC-383
TT 65-62042

Unclassified report

Trans. of Rikagaku Kenkyujo Hokoku (Japan) v30 n4 p233-48 1954.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Photoelasticity, Materials), (*Materials, Photoelasticity), (*Epoxy plastics, Photoelasticity), (*Polyester plastics, Photoelasticity), Synthesis (Chemistry), Aging (Materials), Copolymerization, Polymers, Freezing, Polymerization, Heat treatment, Catalysts, Mechanical properties, Extrusion.

Detailed studies principally on three dimensional photoelasticity by the freezing method were made of some new materials. These include epoxy resin cured by poly addition reaction, homopolymer or unsaturated alkyd and diallyl phthalate cured by chain copolymerization reaction, and copolymer resins (copolymers: styrol, divinyl benzol, diallyl phthalate and diallyl cyanurate). The properties of these resins vary widely according to type and orientation of starting material, method of synthesis, catalyst, hardener, accelerator or curing conditions. Favorable and unfavorable qualities with respect to freezing were evaluated. Consistency of quality reproducibility and applicability as anisotropic photoelastic material were investigated. (Author)

AD-614 472 Div. 14, 25
CFSTI Prices: HC$4.00 MF$1.00

New York State Coll. of Ceramics, Alfred Univ.
SEMICONDUCTING MATERIALS. PART III. AN INVESTIGATION OF THE DIELECTRIC PROPERTIES OF SINGLE-CRYSTAL VERSUS POLYCRYSTALLINE MATERIALS.
Final rept.,
by Donald L. Guile. 12 Apr 65, 117p
Contract Nonr150301, Proj. NR015 215

Unclassified report

See also AD-610 382.

Descriptors: (*Semiconductors, Dielectric properties), Single crystals, Crystals, Magnesium compounds, Oxides, Fluorides, Zinc compounds, Sulfides, Heat of activation, Ceramic materials.

Studies were conducted to determine the effect of grain boundaries upon polycrystalline ceramic dielectrics. For this purpose, dielectric measurements of polycrystalline samples were compared with measurements on single crystals. An attempt was made to analyze the results using Koops approach which satisfies the case of a stratified dielectric. However, this approach is shown to be invalid for the samples studied as might be suspected since the assumptions by Koops are not necessarily satisfied. The dielectric properties of MgO single crystals and polycrystalline samples, MgF2 polycrystalline samples and a ZnS sample are presented in graphic form. Activation energies are given for the loss mechanisms present. The effect of adsorbed moisture or gas on improperly prepared samples is demonstrated by comparing dielectric measurements with infrared transmission studies. It is concluded that the increased dielectric constant and dielectric loss in polycrystalline samples is due to a combination of conduction, probably ionic, and interfacial polarization with no unique relaxation time existing. (Author)

AD-614 499 Div. 14, 4

National Research Council of Canada, Ottawa (Ontario).
THE EFFECT OF NONCELLULOSIC MATERIAL ON THE ACTINIC DEGRADATION OF COTTON FABRIC. PART II: COPPER OXINATE AND NICKEL OXINATE,
by B. A. Gingras, J. D. Cooney, and C. H. Bayley.
26 Jun 64, 6p Rept. no. NRC-8249

Unclassified report

Pub. in Textile Research Journal v34 n12 p1086-90 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cotton textiles, Degradation), (*Photochemistry, Cotton textiles), (*Quinolines, Fungicides), Metalorganic compounds, Copper compounds, Nickel compounds, Ultraviolet radiation, Canada, Complex compounds.

Copper oxinate and nickel oxinate were found to be protective at all concentrations studied, and their behavior is considered to relate to the fact that they are stable metal chelates and not ionic salts, which are known to accelerate the degradation of cotton. Both compounds were found to absorb light in the high-energy ultraviolet region. The results are discussed in terms of structure and degree of ultraviolet absorption of the compounds. (Author)

15. Mathematics

AD-613 917 Div. 15

Electronics Research Labs., Univ. of California, Berkeley.
CONSISTENT ESTIMATES AND ZERO-ONE SETS.
Revised ed.,
by Leo Breiman, Lucien LeCam, and Lorraine Schwartz. 4 Oct 63, 6p
Contract Nonr22253; Grant DA ARO D31 124G83
AROD 362:66

Unclassified report

Pub. in Annals of Mathematical Statistics (U. S.) v35 n1 p157-61 Mar 1964 (Copies not available to DDC or Clearinghouse customers)
Revision of manuscript submitted 21 Aug 62.

Descriptors: (*Set theory, Measure theory), (*Measure theory, Set theory), Stocahstic processes, Functional analysis, Statistical analysis.

AD-613 926 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Pennsylvania Univ., Philadelphia.
A NOTE ON DERIVATIONS OF OPERATOR ALGEBRAS,
by Richard B. Kadison. 1965, 7p
Contract Nonr55157; Grant NSF GP1604, Proj. NR043 325

Unclassified report

See also AD-613 928.

Descriptors: (*Algebras, Operators (Mathematics)), (*Operators (Mathematics), Algebras), Algebraic topology, Groups (Mathematics).

Theorems and proofs are presented which show strong evidence that all derivations of von Neumann algebras are inner.

AD-613 927 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Pennsylvania Univ., Philadelphia.
DERIVATIONS OF OPERATOR GROUP ALGEBRAS,
by Richard V. Kadison and John R. Ringrose.
1965, 21p
Contract Nonr55157; Grant NSF GP4059,
Proj. NR043 325

Unclassified report

Descriptors: (*Algebras, Groups (Mathematics)), (*Groups (Mathematics), Operators (Mathematics)), (*Operators (Mathematics), Algebras), Matrix algebra, Set theory, Permutations.

It is shown that each derivation of the von Neumann algebra generated by the regular representation of a discrete group is inner.

AD-613 928 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Pennsylvania Univ., Philadelphia.
DERIVATIONS OF OPERATOR ALGEBRAS,
by Richard V. Kadison. 1963, 18p
Grants NSF GP1604, NSF GP4059, Proj. NR043 325

Unclassified report

See also AD-613 926.

Descriptors: (*Algebras, Operators, (Mathematics), (*Operators (Mathematics), Algebras), Algebraic topology, Groups (Mathematics).

The paper is concerned with results describing the nature of derivations of von Neumann algebras.

AD-613 974 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
ON THE THEORY OF RANDOM FUNCTIONS AND THE CONTROL OF PROCESSES ON THE BASIS OF INCOMPLETE DATA,
by A. N. Shiryaev. Apr 65, 42p
Rept. no. RM-4527-PR
Contract AF49 638 700
TT 65-61998

Unclassified report

Trans. from mono. Conference on Information Theory, Statistical Decision Functions, and Random Processes (no. 3) Prague. Transactions.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Statistical functions, Theory), (*Decision theory, Stochastic processes), Dynamic programming, Recursive functions, Sequential analysis, Optimization, USSR.

The topics covered include (1) recurrence relations for nonadditive functional -- discrete time, (2) determination of optimal decisions, and (3) the detection of a change in the probability law of the observed process.

AD-613 990 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
SOME RESULTS AND PROBLEMS IN STOCHASTIC LINEAR PROGRAMMING,
by Albert Madansky. 19 Jan 59, 21p
Rept. no. P-1596

Unclassified report

Descriptors: (*Linear programming, Stochastic processes), (*Stochastic processes, Linear programming), Operations research, Management engineering.

Results and problems in the ordinary 'here-and-now' and 'wait-and-see' stochastic linear programming problems are described. A general formulation of the 'here-and-now' problem is presented, and an approach for solving a special kind of 'here-and-now' problem is suggested. (Author)

AD-614 040 Div. 15, 8
CFSTI Prices: HC$5.00 MF$1.25

Massachusetts Inst. of Tech., Cambridge.
ON FACTORING THE CORRELATIONS OF DISCRETE MULTI-VARIABLE STOCHASTIC PROCESSES.
Doctoral thesis,
by Ralph A. Wiggins. 28 Feb 65, 198p
Scientific rept. no. SR-9
Contract AF19 604 7378, Project. 8652; ARPA Order 180 61,
Task 865203
AFCRL 65-207

Unclassified report

Descriptors: (*Stochastic processes, Factor analysis), (*Statistical analysis, Stochastic processes), Correl-

ation techniques, Least squares method, Polynomials, Matrix algebra, Transformations (Mathematics), Band-pass filters.

The theory of discrete scalar time series analysis is extended to multivariable processes. This extension is facilitated by expanding the algebra of polynomial matrices (matrices with polynomial elements).

AD-614 064 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

California Univ., Los Angeles.
ON RANDOM WALKS WITH AN ABSORBING BARRIER AND GAMBLING SYSTEMS,
by L. Breiman. Mar 65, 14p
Working Paper no. WP-71
Contract Nonr23375, Proj. NR047 041
Unclassified report

Research Supported by the Western Management Science Institute under a grant from the Ford Foundation.

Descriptors: (*Game theory, Stochastic processes), (*Numerical analysis, Game theory), Measure theory, Statistical functions, Optimization, Operations research.

For random walks with an absorbing barrier at the origin and negative drift, it is proven that all sufficiently smooth bounded super-additive functions have a limit at plus infinity. This result is applied to a sequence of favorable gambling games to prove a conjecture due to Ferguson concerning asymptotically optimal betting strategies. (Author)

AD-614 070 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Purdue Univ., Lafayette, Ind.
SELECTION AND RANKING PROCEDURES AND ORDER STATISTICS FOR THE BINOMIAL DISTRIBUTION,
by Shanti S. Gupta. Oct 64, 16p
Mimeograph series no. MS-31
Contract AF33 657 11737 Unclassified report

Prepared in cooperation with Stanford Univ., Calif., Contract Nonr-225(53).

Descriptors: (*Binomials, Distribution theory), (*Distribution theory, Binomials), Statistical analysis, Decision theory, Population (Mathematics), Probability.

The first part of the paper describes some work on selection and ranking procedures for binomial populations. The procedures discussed fall in the following categories (i) procedures for selecting a subset containing the best population or all those populations that are better than a standard (ii) procedures for selecting the best. The second part of the paper discusses order statistics from the binomial distribution and describes some new tables of moments and cumulative distribution function of these order statistics. (Author)

AD-614 121 Div. 15

Carnegie Inst. of Tech., Pittsburgh, Pa.
Graduate School of Industrial Administration.
A MULTIPHASE-DUAL ALGORITHM FOR THE ZERO-ONE INTEGER PROGRAMMING PROBLEM.
Final rept. Revised ed.,
by Fred Glover. Feb 65, 55p
Management sciences research rept. no. MSRR-25
Contract Nonr76024, Proj. NR047 048
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.
Revision of report dated Dec 64.

Descriptors: (*Linear programming, Combinatorial analysis), (*Combinatorial analysis, Linear programming), Search theory, Optimization, Calculus of variations, Operations research.

Following a line of approach recently applied to the 0-1 integer programming problem with some success by Egon Balas, the algorithm of this paper is based upon an underlying tree search structure upon which a series of tests is superimposed to exclude large portions of the tree of all possible 0-1 solutions from examination. In the present method, the specific design of the enumeration and tests, supplemented by the use of a special type of constraint called a 'surrogate constraint,' results in an algorithm that appears to be quite efficient in relation to other algorithms currently available for solving the 0-1 integer programming problem. Early indications of efficiency must, however, be regarded as suggestive rather than conclusive, due to the limited range and size of problems so far examined. Following the analytical development of the method, three example problems are solved in detail with the Multiphase-Dual Algorithm to illustrate various aspects of its application. An extension of the algorithm to the general integer programming problem in bounded variables is briefly sketched in a concluding section. (Author)

AD-614 131 Div. 15
CFSTI Prices: HC$7.00 MF$1.75

Minnesota Univ., Minneapolis.
RANK ORDER PROBABILITIES: TWO-SAMPLE NORMAL SHIFT ALTERNATIVES,
by Roy C. Milton. Jan 65, 333p
Technical rept. no. TR-53
Contract Nonr71031, Proj. NR042 003
Unclassified report

Descriptors: (*Probability, Tables), Statistical analysis, Sampling, Statistical tests.

The report is intended to be the first chapter of a monograph concerning exact properties of rank order procedures under normal shift alternatives. Rank order probabilities are presented in tabular form. Applications of these tabled values in several areas are proposed, including investigation of (1) the small sample power of various standard two-sample nonparametric tests for location against normal alternatives, (2) the most powerful rank and rank sum tests for location with respect to normal alternatives, and (3) sequential two-sample procedures based on ranks and the sum of ranks with respect to normal alternatives.

AD-614 157 Div. 15

Chicago Univ., Ill.
PRODUCTS BETWEEN HOMOTOPY GROUPS AND THE J-MORPHISM,
by G. S. McCarty, Jr. 21 Jan 64, 11p
Grants DA AROD31 124G157, NSF G19662
AROD 2160:16
Unclassified report

Pub. in Quarterly Journal of Mathematics (Gt. Brit.) v15 (ser. 2) n60 p362-70 Dec 1964 (Copies available only to DDC users).

Descriptors: (*Algebraic topology, Combinatorial analysis), (*Combinatorial analysis, Algebraic topology), Groups (Mathematics), Mapping (Transformations).

AD-614 158 Div. 15

Institute for Fluid Dynamics and Applied Mathematics, Univ. of Maryland, College Park.
EQUIVALENCE OF CERTAIN INEQUALITIES COMPLEMENTING THOSE OF CAUCHY-SCHWARZ AND HOLDER,
by J. B. Diaz, A. J. Goldman, and F. T. Metcalf.
26 Aug 64, 5p
Grant AF AFOSR400 64, Proj. 9749, Task 9749 01
AFOSR 65-0602 Unclassified report

Pub. in Journal of Research of the National Bureau of Standards-B. Mathematics and Mathematical Physics v68B n4 p147-9 Oct-Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Inequalities, Measure theory), Functional analysis, Real numbers.

An inequality due to Diaz and Metcalf, which complements the Cauchy-Schwarz Inequality, is shown equivalent to a result of Rennie. A more general inequality due to Diaz and Metcalf, which complements that of Holder, is proven equivalent to a previously published generalization of Rennie's Inequality. (Author)

AD-614 256 Div. 15
CFSTI Prices: HC$3.00 MF$0.75

Naval Postgraduate School, Monterey, Calif.
THE LEBESGUE-STIELJES INTEGRAL AS APPLIED IN PROBABILITY DISTRIBUTION THEORY.
Master's thesis,
by Thomas A. Van Sant. 1964, 61p
Unclassified report

Descriptors: (*Integrals, Probability), (*Probability, Integrals), (*Distribution theory, Probability), Measure theory, Real numbers, Algebras, Statistical functions.

Necessary definitions and theorems from real variable dealing with some properties of Lebesgue-Stieljes measures, monotone non-decreasing functions, Borel sets, functions of bounded variation and Borel measureable functions are set forth in the introduction. Chapter 2 is concerned with establishing a one to one correspondence between Lebesgue-Stieljes measures and certain equivalence classes of functions which are monotone non decreasing and continuous on the right. In Chapter 3 the Lebesgue-Stieljes Integral is defined and some of its properties are demonstrated. In Chapter 4 probability distribution function is defined and the notions in Chapters 2 and 3 are used to show that the Lebesgue-Stieljes integral of any probability distribution function can be expressed as a countable sum of positive numbers added to the Lebesgue-Stieljes integral of a continuous probability distribution function. The conclusion indicates how the Lebesgue-Stieljes integral may be used to define the probability associated with a Borel set of real numbers. (Author)

AD-614 271 Div. 15
CFSTI Prices: HC$3.00 MF$0.75

Stanford Univ., Calif.
SEQUENTIAL RANKING PROCEDURES.
by Elias Alphonse Parent, Jr. 23 Apr 65, 77p
Technical rept. no. TR-80
Contract Nonr22553, Proj. NR042 002
Unclassified report

Supported in part by the U. S. Army, U. S. Air Force, and NASA.

Descriptors: (*Sequential analysis, Theory), Stochastic processes, Distribution theory, Control, Sampling, Statistical analysis.

AD-614 301 Div. 15

Lund Univ. (Sweden).
A THEOREM ON RANK ORDERS FOR TWO CENSORED SAMPLES,
by Carl-Erik Sarndal. 16 Jun 64, 7p
AROD 2776:16
Unclassified report

Pub. in Annals of Mathematical Statistics v36 n1 p316-21 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Statistical analysis, Theorems), Sampling, Stochastic processes.

AD-614 412 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
FOUR-COLOR REDUCIBILITY OF PLANAR GRAPHS CONTAINING SUBGRAPHS WITH FOUR-POINT BOUNDARIES,
by Norman C. Dalkey. Apr 65, 5p Rept. no. P-3113
Unclassified report

Descriptors: (*Graphics, Colors), Boundary value problems.

An inductive hypothesis is offered concerning the 4-color reducibility within a planar graph where the boundary between a proper subgraph and its complement has 4 points. Where such a graph having a boundary with 4 points is fully triangulated, the boundary points will form a square: the two components can be completed by connecting opposite corners of the square, and the opposite corners must be assigned different colors. The inductive hypothesis shows that (1) graphs smaller than the original graph can be 4-colored, (2) each of the components will have several possible colorings, and (3) there will always be a pair of colorings for the components that will match.

AD-614 419 Div. 15, 26
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
TWO NOTES ON ESTIMATING SHAPE PARAMETERS,
by Robert B. Wilson. Apr 65, 20p
Rept. no. RM-4459-PR
Contract AF49 638 700
Unclassified report

Descriptors: (*Statistical distributions, Reliability), (*Reliability, Statistical distributions), Probability, Decision theory, Statistical analysis.

In this memorandum, new estimators are derived for the shape parameters of a Weibull time-to-failure distribution, and a Gamma distribution. In each case, a numerical table is presented to determine these estimators. The approach to reliability analysis taken differs from the usual practice; instead of simultaneously estimating the various parameters of multi-parameter failure distributions, a marginal estimator is obtained for only one parameter of a two-parameter failure distribution. The results should interest statisticians, engineers, and others concerned with reliability measurement and analysis. (Author)

AD-614 436 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

California Univ., La Jolla.
TRANSITION PROBABILITY OPERATORS.

Technical rept.,
by Murray Rosenblatt. Feb 65, 21p
Contract Nonr221626, Proj. NR042 217, Task 26
Unclassified report

Descriptors: (*Operators (Mathematics), Probability), (*Probability, Operators (Mathematics)), Invariance, Measure theory, Functional analysis, Topology.

A few remarks are first made on invariant probability measures of a transition probability operator. The notion of irreducibility is introduced for a transition operator acting on the continuous functions on a compact space and implications of this assumption are examined. Finally the unitary and isometric parts of the operator are isolated and interpreted in terms of the behavior of iterates of the operator. (Author)

AD-614 483 Div. 15
CFSTI Prices: HC$3.00 MF$0.75

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
SUPERPOSITION IN A CLASS OF NONLINEAR SYSTEMS.
Doctoral thesis,
by Alan V. Oppenheim. 31 Mar 65, 66p
Technical rept. no. 432
Contract DA36 039AMC03200E; Grant NSF GP2495
Unclassified report

Descriptors: (*Nonlinear systems, Matrix algebra), (*Integral transforms, Nonlinear systems), Mapping (Transformations), Functional analysis, Feedback, Servomechanisms.

Many nonlinear systems can be interpreted as linear transformations between vector spaces under appropriate definitions for the vector operations on the inputs and outputs. The class of systems which can be represented in this way, is discussed here. This class, referred to as the class of homomorphic systems, is shown to include all invertible systems. Necessary and sufficient conditions on a noninvertible system such that it is a homomorphic system, are derived. A canonic representation of homomorphic systems is presented. This representation consists of a cascade of three systems, the first and last of which are determined only by the vector space of inputs and the vector space of outputs, respectively. The second system in the canonic representation is a linear system. Necessary and sufficient conditions are presented under which all of the memory in the system can be concentrated in the linear portion of the canonic representation. A means for classifying homomorphic systems, suggested by the canonic representation, is discussed. This means of classification offers the advantage that systems within a class differ only in the linear portion of the canonic representation. Applications of the theory are considered for a class of nonlinear feedback systems. (Author)

AD-614 490 Div. 15, 26
CFSTI Prices: HC$1.00 MF$0.50

Operations Research Center, Univ. of California, Berkeley.
NONPARAMETRIC LIFE TEST SAMPLING PLANS,
by Richard E. Barlow and Shanti S. Gupta. Jul 64, 21p Mimeograph Series no. MS-29
Contracts Nonr365618, Nonr22553
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Sampling, Theory), Quality control, Statistical distributions, Operations research, Life expectancy.

AD-614 526 Div. 15

California Univ., Berkeley.
OPTIMUM STRATIFICATION WITH TWO CHARACTERS.
Revised ed.,
by S. P. Ghosh. 12 Mar 63, 8p
Grants DA ARO D31 124G83, DA ARO D31 124G548
AROD 362:65
Unclassified report

Pub. in Annals of Mathematical Statistics v34 n3 p866-72 Sep 1963 (Copies not available to DDC or Clearinghouse customers)
Revision of manuscript submitted 14 Mar 62.

Descriptors: (*Statistical distributions, Optimization), Sampling, Population (Mathematics), Analysis of variance.

AD-614 528 Div. 15

California Univ., Los Angeles.
GENERALIZED RATIONAL APPROXIMATION,
by E. W. Cheney and H. L. Loeb. 4 Nov 63, 18p
Grant AF AFOSR77 63, Proj. 9749, Task 974901
AFOSR 65-0624
Unclassified report

Pub. in Journal Siam Numerical Analysis v1(SerB) p11-25 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Numerical analysis, Functions), Functional analysis, Polynomials, Fourier analysis, Trigonometry.

An extension of Rice's theory of 'varisolvent' function families to what is termed generalized rational functions is given. It is a further development of the rational approximation problem, extending the characterization theorem about linear approximations to the rational case and giving special consideration to a rational trigonometric form. (Author)

AD-614 543 Div. 15

California Univ., Los Angeles.
HARMONIC FUNCTIONS WITH GIVEN VALUES AND MINIMUM NORMS IN RIEMANNIAN SPACES,
by Leo Sario and Noriko Fukuda. 9 Dec 64, 5p
Grant DA ARO D31 124G499
AROD 1517:71
Unclassified report

Pub. in Proceedings of the National Academy of Sciences v53 n2 p270-3 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Potential theory, Algebraic topology), (*Algebraic topology, Potential theory), Functional analysis, Green's function, Boundary value problems.

AD-614 559 Div. 15, 8

Northwestern Univ., Evanston, Ill.
DISTANCE MATRIX OF A GRAPH AND ITS

REALIZABILITY,
by S. L. Hakimi and S. S. Yau. 28 Feb 64, 13p
AROD 3298:14

Unclassified report

Pub. in Quarterly of Applied Mathematics v22 n4 p305-17 Jan 1965 (Copies not available to DDC or Clearinghouse customers).
Revision of manuscript submitted 15 Nov 63.

Descriptors: (*Matrix algebra, Graphics), (*Linear programming, Matrix algebra), Topology, Reliability, Optimization, Electrical networks, Synthesis.

The distances in a linear graph are described by a distance matrix D. The realizability of a given D by a linear graph is discussed and conditions under which the realization of D is unique are established. The optimum realization of D, (i.e., the realization of D with 'minimum total length'), is investigated. A procedure is given by which a tree realization of D can be found, if such a realization exists. Finally, it is shown that a tree realization, if it exists, is unique and is the optimum realization of D. (Author)

16. Medical Sciences

AD-613 918 Div. 16

Stanford Medical Center, Palo Alto, Calif.
THE IMPORTANCE AND RELIABILITY OF THE ROENTGENOGRAPHIC EXAMINATION OF THE SMALL BOWEL IN PATIENTS WITH TROPICAL SPRUE,
by William L. Caldwell, Virginia L. Swanson, and Theodore M. Bayless. 1964, 14p
Unclassified report

Pub. in Radiology (U. S.) v84 n2 p227-40 Feb 1965
(Copies not available to DDC or Clearinghouse customers).
Presented in part at the Forty-ninth Annual Meeting of the Radiological Society of North America, Chicago, Ill., Nov 17-22, 1963.

Descriptors: (*Deficiency diseases, Radiography), (*Radiography, Deficiency diseases), Tropical regions, Puerto Rico, X rays, Intestines, Diagnosis, Absorption (Biological), Histological techniques, Medical examinations, Excretion, Fats, Xylose, Vitamin A, Carotenoids, Test methods.

The interpretations of 322 radiographic examinations of the small bowel, including 228 in patients with tropical sprue, are compared with the results of other methods commonly employed to detect and evaluate malabsorption. Good correlation is revealed between the interpretation of the small bowel examination and the intestinal biopsy evaluation, the fecal fat determination, and the xylose absorption in patients with tropical sprue. The data presented indicate that the radiographic study of the small bowel, using the technic described, is a reliable and satisfactory method of diagnosing malabsorption due to intestinal mucosal disease, particularly when compared with the other common testing parameters. Ninety-three per cent of the small bowel examinations were abnormal in patients thought to have tropical sprue. The fecal fat determination and the intestinal biopsy evaluation were slightly more accurate. There were 13 per cent 'false negative' determinations with the 5 g xylose absorptive test, however, and approximately 20 per cent normal vitamin A and carotene levels in the same group. 'False positive' results for the various tests in nonsprue patients also are evaluated. (Author)

AD-614 024 Div. 16
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
SUBTERRANEAN LIGHT,
by V. Fedorov. 26 Mar 65, 6p FTD-TT-64-1363
TT 65-61996
Unclassified report

Unedited rough draft trans. from Kommunist, Erevan (USSR) n138(9137) p2 Jun 12 1964.

Descriptors: (*Photosynthesis, Underground structures), Ecology, Organic pigments, Light, Biochemistry, Plants (Botany), USSR.

A brief theoretical discussion of photosynthesizing organisms that occur underground is presented.

AD-614 068 Div. 16

Pittsburgh Univ., Pa. School of Medicine.
ATROPINE DETOXICATION DURING HYPOTHERMIA BY THE ISOLATED PERFUSED RAT LIVER.
Final technical rept.,
by Sarah C. Kaiser. 3 Mar 65, 9p
Grant AF AFOSR87 64, Proj. 9777, Task 977701
AFOSR 65-0459
Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Atropine, Toxicity), (*Liver, Hypothermia), Metabolism, Drugs, Blood proteins, Blood vessels, Acclimatization, Surgical techniques, Parenteral infusions, Bile, Anesthesia, Rats.

Experiments were performed on the isolated perfused rat liver in an attempt to obtain a perfusing medium which would be devoid of plasma protein. It was considered that if such a medium could be perfected, it would overcome any hindrance to drug uptake by the liver which might occur due to plasma binding of the drug. Results of this experimentation are outlined. Several exploratory type experiments were performed on the isolated liver in which blood flow through the organ was maintained constant by the readjustment of vascular resistance of the arterialized portal vein. In preparation for a contemplated Air Force Grant request in which the correlation of the toxicity of atropine with its metabolism is acute hypothermia and in cold acclimatization will be studied, work was attempted on a surgical technique which would allow a chronically prepared rat to be intravenously injected and have bile collected without the use of anesthesia.

AD-614 109 Div. 16
CFSTI Prices: HC$3.00 MF$0.75

General Dynamics/Fort Worth, Tex.
DEVELOPMENT AND APPLICATION OF NUCLEAR MEASUREMENT TECHNIQUES,
Technical rept. for 1 Oct 63-30 Sep 64,
by W. E. Dungan, J. K. Miles, and J. R. Bell.
Mar 65, 78p FZK-208
Contract AF29 601 6213, Proj. 6773, Task 677302
WL TR-64-160
Unclassified report

Descriptors: (*Nuclear radiation, Radiation measurement systems), (*Radiation measurement systems, Nuclear radiation), (*Thermal neutrons, Shielding), Test reactors, Cements, Sulfur, Cadmium, Nuclear radiation spectrometers, Neutron detectors, Sulfur, Cadmium compounds, Oxides, Foils, Coincidence counting, Pellets.

A study program was performed on the selection of high-temperature materials for use as passive neutron-field-measuring devices and of thermal-neutron shields for use in extreme nonnuclear environments. Seventeen candidate materials were investigated from which four compounds were selected as most suitable for high-temperature neutron detectors. Also, five high-temperature cements were investigated for possible use as binders in pellet fabrication, and two were found to be acceptable. A limited amount of information is given on the feasibility of replacing cadmium thermal-neutron shields with cadmium oxide shields in high-temperature environments. Facility calibration procedures and results are presented for the modified Ground Test Reactor irradiation chambers, pneumatic tubes, and standard-pile facilities. Also discussed is the interfacility comparison of sulfur-pellet calibrations conducted jointly with three other nuclear facilities. Preliminary results are presented of an experiment performed to reevaluate the counting efficiencies of the Nuclear Aerospace Research Facility end-window counters for commonly used foils. (Author)

AD-614 146 Div. 16

Federation of American Societies for Experimental Biology, Washington, D. C.
PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON COLD ACCLIMATION HELD AT INSTITUTO ANTARTICO ARGENTINO, BUENOS AIRES, AUGUST 5-7, 1959.
Final rept.,
ed. by Robert E. Smith, Dorothy J. Heijer, Ralph Brauer, Laurence Irving, and Oliver Heroux.
1960, 174p
Contract AF49 638 607
AFOSR 386

Unclassified report

Pub. in Federation Proceedings v19 n4 pt 2 s5 Dec 1960. (Copies not available to DDC or Clearinghouse customers.)

Descriptors: (*Acclimatization, Symposia), Polar regions, Adaptation (Physiology), Heat production (Biology), Exposure, Metabolism, Endocrine glands, Body temperature, Adrenocorticotropic hormone, Thyroid hormones, Thyroxine, Liver, Amines, Central nervous system, Sensory mechanisms, Adrenal cortex, Ascorbic acid, Stress (Physiology), Immunity, Electrolytes (Physiology), Fatty acids, Glucose, Tissues (Biology), Cells (Biology), Mitochondria.

Contents:
Man in a cold environment
Thermogenesis in the acclimated animal
Neurohumoral response patterns and endocrine functions
Intermediary metabolism
Cellular and subcellular energetics
General discussion and summary of the symposium.

AD-614 148 Div. 16, 28

Washington Univ., St. Louis, Mo. School of Medicine.
PHYSIOLOGICAL CORRELATES OF MENTAL DISEASE,
by J. A. Stern and D. G. McDonald. 1964, 40p
Contract Nonr81613; Grant PHS MH2755

Unclassified report

Pub. in Annual Review of Psychology v16 p225-64 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Mental disorders, Physiology), (*Physiology, Mental disorders), Psychiatry, Abnormal psychology, Behavior, Genetics, Metabolism, Personality, Psychoses, Electroencephalography, Central nervous system, Drugs, Autonomic nervous system, Stress (Psychology), Biochemistry, Pharmacology, Body fluids, Diagnosis, Reviews.

A review of research involving the physiological correlates of psychiatric disturbances is presented. The basic philosophy underlying the research is that along with deranged behavior one should be able to find alterations in physiological measures, and that physiological indicants may become useful in the prediction and control of abnormal behavior. Three different conceptual frameworks are dealt with: (1) the suggestion that behavioral disturbances are caused by abnormal physiological processes; (2) that the two simply coexist in time; and (3) that the behavior disturbances cause physiological abnormalities.

AD-614 178 Div. 16

California Univ., Berkeley. School of Optometry.
VISUAL ACUITY,
by Gerald Westheimer. 1965, 23p
Technical rept. no. TR-6
Contract Nonr22282, Proj. NR140 195

Unclassified report

Pub. in Annual Review of Psychology v16 p359-80 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Visual acuity, Theory), Vision, Eye, Retina, Optical images, Photoreceptors, Thresholds (Physiology), Light, Adaptation (Physiology), Illumination, Diffraction, Refraction, Physiology, Fourier analysis, Pathology, Ophthalmology, Tests.

Tests for visual acuity; Factors influencing visual acuity: retinal position; orientation of test objects: luminance; state of adaptation; contrast; refractive state; wavelength; observation time; observation distance and eye position; binocular effects; age; stabilization of retinal image; effect of surround; pupil size; eye movements and target movements; miscellaneous effects; Amblyopia; Comparative studies; Fourier theory and resolution.

AD-614 179 Div. 16

Armed Forces Inst. of Pathology, Army Medical Center, Washington, D. C.
SPECIFICITY OF GUINEA-PIG ANTIBODIES AND DELAYED HYPERSENSITIVITY,
by Felix Borek and Arthur Silverstein.
1965, 4p
Contract 6X61 01 001 03

Unclassified report

Pub. in Nature v205 n4968 p299-300 Jan 16 1965 (Copies available only to DDC users).

Descriptors: (*Antigens and antibodies, Guinea pigs), Immunity, Antigen - antibody reactions, Proteins (Conjugated), Sensitivity.

The immunological specificity of the delayed hypersensitivity response in guinea-pigs stands in direct contrast to the specificity of rabbit antibodies. As many authors have shown, the elicitation of the delayed hypersensitivity reaction appears to involve an obligatory participation of the carrier protein as well as the haptenic moiety. Based on this specificity difference, it has been suggested that the delayed response recognizes and requires an appreciably larger antigenic determinant than does conventional circulating antibody. These specificity differences have also been cited in support of the suggestion that delayed hypersensitivity is unrelated to other forms of immunological response. Since the results cited above were based on experiments involving two different animal species, it was of interest to examine the guinea-pig antibodies, frequently detectable in the circulation a few days after the development of delayed hypersensitivity to a single injection of a hapten-protein conjugate. The specificity of these antibodies was compared with that of the delayed reaction on one hand and of rabbit anti-hapten antibodies on the other.

AD-614 185 Div. 16

California Univ., Los Angeles.
INFLUENCE OF THE GASTROINTESTINAL IODIDE CYCLE ON THE EARLY DISTRIBUTION OF RADIOACTIVE IODIDE IN MAN,
by Marguerite T. Hays and David H. Solomon.
19 Sep 64, 11p
Contract Nonr23336; Grant PHS AM5035

Unclassified report

Pub. in Journal of Clinical Investigation v44 n1 p117-27 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Iodides, Absorption (Biological)), (*Gastrointestinal system, Iodides), (*Radioactive isotopes, Gastrointestinal system), Tracer studies, Distribution, Thyroid gland, Radioactivity, Blood plasma, Urine, Intestines, Stomach, Salivary glands, Body weight, Metabolism.

The salivary-gastric-enteric cycle of radioactive iodide was studied during the first 3 hours after isotope administration in nine normal subjects. Radioiodide in the thyroid, plasma, urine, and pooled salivary-gastric secretions was measured frequently. Control sessions for each subject were identical, except that no secretions were aspirated from the gastric tube. Radioiodide recovered from the stomach averaged 23% of that administered (range, 11 to 44%). Thyroidal clearance averaged 16 ml per minute; renal clearance, 34 ml per minute; and gastrosalivary clearance (not corrected for dead space), 46 ml per minute. When gastric contents were removed, the nonthyroidal, nonurinary volume of distribution remained constant (averaging 20.1 L or 27% of body weight) after the first hour, and plasma radioactivity declined along a simple exponential curve. The rate of this decline could be accounted for by the summed thyroidal, renal, and gastrosalivary clearance rates. In the control sessions, the increase in volume of distribution persisted longer, and in four subjects it was still evident at 180 minutes. Thigh/plasma ratio became constant after 1 hour, but was not so good a predictor of nongastrointestinal volume of distribution as was body weight. (Author)

AD-614 186 Div. 16

Armed Forces Inst. of Pathology, Army Medical Center, Washington, D. C.
OCULAR COMPLICATIONS OF STEROID THERAPY,
by Ben S. Fine, John W. Mctigue, and Lorenz E. Zimmerman. 1965, 5p
Unclassified report

Pub. in Medical Annals of the District of Columbia v34 n2 p51-5 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Steroids, Infectious diseases), (*Eye, Pathology), Corticosteroid agents, Fungi, Diseases, Bacteria, Virus diseases, Cornea, Herpes simplex virus, Ophthalmology, Therapy.

Steroids have become a most important addition to the growing list of valuable therapeutic agents that have been introduced into ophthalmology since the end of World War II. Their widespread and sometimes injudicious use, however, has led to a number of ocular complications. Cases illustrating two of the more serious corneal complications, dendritic keratitis and keratomycosis, are presented. (Author)

AD-614 191 Div. 16

SEATO Medical Research Lab., Bangkok (Thialand).
A FIELD TRIAL OF A NEW TRANSPORT MEDIUM FOR COLLECTION OF FECES FOR BACTERIOLOGIC EXAMINATION,
by Sidney Gaines, Shamin Ul Haque, Wichiyan Paniom, Chiraphun Duangmani, and Sylvia G. Cary. 1964, 6p
Unclassified report

Pub. in American Journal of Tropical Medicine and Hygiene v14 n1 p136-40 Jan 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Culture media, Enterbacteriaceae), (*Enterobacteriaceae, Culture media), Collecting methods, Excretion, Diarrhea, Salmonella, Shigella, Escherichia coli, Preparation, Thailand.

A simple medium for the collection and transport of stool or rectal swabs was tested in an area where diarrheas are endemic. In most instances, enteric pathogens survived 7 days or longer following inoculation of the medium. Interference by non-pathogenic bacteria commonly found in the stool was not apparent. The medium consists of sodium thioglycollate, Na2HPO4,CaCl2, NaCl, and agar in demineralized distilled water, and is adjusted to pH 8.4. It is easily and cheaply prepared, does not need refrigeration prior to use or incubation following inoculation, and has a small space requirement. The semi-solid nature of the medium eliminates the leakage or spillage often associated with fluid-collecting media. Swabs for use with the medium are prepared by dipping them into hot Sorenson's buffer, pH 8.1, followed by sterilization and drying. It was concluded that the medium provides a practical, effective means for the collection and transport of fecal material for subsequent bacteriologic examination. (Author)

AD-614 193 Div. 16, 4

Naval Medical Research Inst., Bethesda, Md.
REDUCTION AND RE-OXIDATION OF THE DISULPHIDE BONDS OF SOY BEAN TRYPSIN INHIBITOR,
by R. F. Steiner. 1964, 4p
Research rept. no. MR-005.06-0001.01, 24
Unclassified report

Pub. in Nature v204 n4958 p579 Nov 7 1964
(Copies available only to DDC users).

Descriptors: (*Proteins, Molecular structure), Chemical bonds, Sulfides, Reduction (Chemistry), Oxidation, Biological products.

It is shown that soy bean trypsin inhibitor may be added to the list of proteins which are capable of spontaneous re-formation of a conformation resembling the native after an extensive loss of structure.

AD-614 194 Div. 16

Naval Medical Research Inst., Bethesda, Md.
OPHTHALMOSCOPY OF PIGEONS USING TRANSILLUMINATION,
by M. L. Wolbarsht, P. E. Stopp, and J. E. Goodson.
31 Mar 64, 2p Research rept. no. MR-005.13-1500.06, 1
Unclassified report

Pub. in Separatum Experientia v20 p466 1964
(Copies available only to DDC users).

Descriptors: (*Pigeons, Ophthalmology), (*Ophthalmology, Medical equipment), (*Eye, Medical examination), Photography, Cameras, Illumination.

A new method for examining the eyes of pigeons is described. The method employs indirect, transverse illumination of the head, and permits photography by conventional fundus cameras. The method may be useful in teaching and general laboratory work since it allows the easy observation of the interior of the eye and the pecten.

AD-614 198 Div. 16

Columbia Univ., New York. Coll. of Physicans and Surgeons.
STUDIES ON THE ROLE OF POTASSIUM IONS IN THE LETHAL TOXICITY OF STREPTOLYSIN O,
by S. P. Halbert, E. Dahle, S. Keatinge, and R. Bircher. 1963, 18p Unclassified report

Pub. in Recent Advances in the Pharmacology of Toxins. Proceedings of the International Pharmacological Meeting, (2nd) Prague, 20-23 Aug 63. (Copies available only to DDC users)
Supported by ONR, New York Heart Association, and Life Insurance Medical Research Fund.

Descriptors: (*Proteins, Toxicity), (*Toxins and antitoxins, Toxicity), (*Potassium, Plasma), (*Plasma, Potassium), Rabbits, Hemolysis, Electrolytes (Physiology), Potassium compounds, Chlorides, Electrocardiography, Mice, Erythrocytes, Arrhythmia.

The acute lethal toxicity of streptolysin O for rabbits was usually associated with variable but often considerable and rapid intravascular hemolysis, with high plasma K(+) levels, and severe ventricular arrhythmias. Evidence was obtained that the plasma potassium after streptolysin injection could be derived from sources other than erythrocytes. Streptolysin induced intravascular hemolysis could occur without significant electrocardiographic change or elevation of plasma potassium. Similar findings in mice were encountered, in spite of the relative resistance of mouse erythrocytes to in vitro hemolysis by streptolysin O. Potassium chloride injected intravenously mimicked some of the changes produced by streptolysin O, but an anti-serotonin agent which protected against the lethal toxicity of streptolysin O, failed to protect against potassium chloride toxicity. Saponin toxicity in rabbits resembled that of streptolysin O with regard to the electrocardiographic changes, plasma K(+) elevation and the intravascular hemolysis. (Author)

AD-614 199 Div. 16, 25

Columbia Univ., New York.
MAINTAINING AN ABSOLUTE HUE IN THE PRESENCE OF DIFFERENT BACKGROUND COLORS,
by Munehira Akita, C. H. Graham, and Yun Hsia.
14 Apr 64, 20p
Unclassified report

Pub. in Vision Research (Gt. Brit.) v4 p539-56 1964
(Copies available only to DDC users)
Supported by ONR and Institutional Scientific Research Pool of Columbia University.

Descriptors: (*Color vision, Visual perception), (*Visual perception, Color vision), Psychometrics, Colors, Optics.

Subjects were instructed to make wavelength settings for various hues by an absolute method in the presence of surround-field colors or darkness. Surround- and test-field colors were equated in luminance. The subject's compensatory shift in setting for the maintenance of a test-color is taken to be the difference between his wavelength setting for the test-color in the presence of the surround-field color and the wavelength setting for the test-color with a dark surround. In general, the compensatory shift in wavelength setting is always in the direction of the background wavelength. A discussion regarding the nature of the shift setting is given. (Author)

AD-614 202 Div. 16

Oxford Univ. (England).
THE ROLE OF GANGLIOSIDE IN THE MODE OF ACTION OF TETANUS TOXIN,
by Jane Mellanby and W. E. van Heyningen. 1962, 4p
Unclassified report

Pub. in Recent Advances in the Pharmacology of Toxins. Proceedings of the International Pharmacological Meeting (2nd) Prague, 20-23 Aug 1963. (Copies available only to DDC users).

Descriptors: (*Clostridium tetani, Toxins and antitoxins), (*Toxins and antitoxins, Clostridium tetani), Central nervous system, Nerve cells, Tissues (Biology), Morphology (Biology), Toxic tolerances, Great Britain.

AD-614 210 Div. 16

Naval Medical Research Inst., Bethesda, Md.
PHOSPHORESCENCE OF CALCIFIED TISSUES,
by K. C. Hoerman and Sandra A. Mancewicz. 1964,
23p Research rept. MR-005.12-5000.02, R-10
Grant PHS DE01577 02
Unclassified report

Pub. in Archives of Oral Biology v9 p517-34 1964
(Copies available only to DDC users)
Prepared in cooperation with the American Dental Association, Bethesda, Md.

Descriptors: (*Tissues (Biology), Calcification), (*Calcification, Phosphorescence), (*Phosphorescence, Calcification), Bone, Teeth, Mouth, Dentistry, Measurement, Light, Phototubes, Intensity, Oscillographs, Luminescence, Cryogenics.

An instrument has been designed and tested for the study of phosphorescent intensities and lifetimes of calcified tissues and other biologic materials in the solid state. Particles of mesh size 200 were compressed in KBr discs, cooled to 93K and exposed to u.v. light (311 m greater than or equal to). Phosphorescence was measured at 45 from the excited surface and 90 from the light source. Emitted light was filtered so that no energy at less than 415 millimicrons fell on the phototube (1P21). Scattered light was eliminated by a rotating shutter. Super-cooling was accomplished by transfer of heat through a copper rod to a reservoir of liquid nitrogen. Human dentine and bone displayed nearly equal phosphorescent intensities. Enamel was approximately 1/3 less luminescent. Phosphorescent lifetimes were calculated from oscillographic presentations of the interval from L sub o (original luminance, arbitrary value) to about L sub o x 10 to the minus 3rd power. For dentine, bone and enamel the experimental lifetimes of phosphorescence were 31 ± 2 sec. Ferric ion and deep stained caries quenched the phosphorescence of dentine. Neither enamel hypoplasia or caries diminished phosphorescent intensities. Phosphorescence of calcified tissues apparently stems principally from the organic moiety. (Author)

AD-614 211 Div. 16

Naval Medical Research Inst., Bethesda, Md.
CHARACTERISTICS OF INSOLUBLE PROTEIN OF TOOTH AND BONE, I. FLUORESCENCE OF SOME ACIDIC HYDROLYTIC FRAGMENTS,
by Sandra A. Mancewicz and K. C. Hoerman.
1964, 13p Research rept. no. MR-005.12-5000.02, R-11
Grant PHS DE01577 02
Unclassified report

Pub. in Archives of Oral Biology v9 p535-44 1964
(Copies available only to DDC users).

Descriptors: (*Teeth, Fluorescence), (*Fluorescence, Teeth), Proteins, Solubility, Bone, Peptides, Amino acids, Hydrolysis, Electrophoresis, Calcification, Tryptophan, Tyrosine, Gelatins, Aromatic compounds.

Peptides were prepared by partial acid hydrolysis of insoluble protein of tooth and bone. Cellulose column electrophoresis was employed to separate major fluorescing peptides. Using parent gelatins, peptide mixtures, and major peptides fractions of the calcified proteins the following measurements were taken: u.v. absorption

and fluorescent excitation and emission spectra, extinction coefficients and total fluorescence. There is evidence that tryptophan and tyrosine contribute to the material of parent gelatin which absorbs at 280 millimicrons, and are partially responsible for the fluorescence of the preparations studied here. The total fluorescence of calcified proteins occurs as a combination of excitation of three or more fluorescing molecules, tyrosine and tryptophan to the extent of their absolute concentration and another fluorophoric group(s) presently unidentified. (Author)

AD-614 218 Div. 16

Indiana Univ., Bloomington. Dept. of Chemistry.
COMPARISON OF THE PEPTIDE MAPS OF ANTI= BODIES AGAINST AN ACIDIC AND A BASIC DETERMINANT GROUP,
by James L. Groff and Felix Haurowitz. 13 Aug 63, 8p
Contracts AT11 1 209, Nonr310400

Unclassified report

Pub. in Immunochemistry v1 p31-6 1964 (Copies available only to DDC users).

Descriptors: (*Antigens and antibodies, Molecular structure), Peptides, Papain, Immune serums, Genetics, Globulins, Immunity, Serum albumin, Electrophoresis, Chromatographic analysis, Organic nitrogen compounds, Arsenic compounds, Ammonium compounds, Sulfur, Amino acids, Rabbits.

Antibodies were isolated from the serum of rabbits injected with azophenylarsonate-BSA or azophenyltrimethylammonium-BSA. The structures of antibodies formed against the two haptens and also those formed against BSA were compared by fingerprinting. No reproducible differences could be detected in the peptide patterns of the univalent fragments obtained by the papain digestion of the antibodies from pooled immune sera against each of the two antigens. When the two hapten-specific antibody species were each prepared from single antisera, a difference involving a single peptide spot was observed. The same difference was found in the peptide maps of the BSA-specific antibody fragments. This suggests that the small difference between the fingerprints in the hapten-specific antibodies may arise from genetic differences in the globulin pattern of the two rabbits or from differences in the organ distribution of the two antigens rather than from the different immunological specificity of the two haptens. A small portion of the peptides obtained by tryptic digestion of the antibodies of their univalent fragments does not migrate upon electrophoresis of chromatography but remains at the origin. (Author)

AD-614 226 Div. 16, 30
CFSTI Prices: HC$2.00 MF$0.50

Isomet Corp., Palisades Park, N. J.
DEVELOPMENT OF A CARBON DIOXIDE PARTIAL PRESSURE SENSOR.
Final rept. for 29 Jan 62-15 Feb 64,
by Gerald Jankowitz and Warren Ruderman. Dec 64, 42p
Contract AF33 657 8096, Proj. 6373, Task 637302
AMRL TR-64-140

Unclassified report

Descriptors: (*Life support, Gas analysis), (*Gas analysis, Carbon dioxide), (*Carbon dioxide, Gas analysis), Controlled atmospheres, Instrumentation, Samplers, Infrared filters, Spectrum analyzers, Preamplifiers, Amplifiers, Meters, Calibration.

The objective of the program was to design and develop a compact airborne CO2 sensor unit capable of sensing and measuring the CO2 content of manned, sealed environments. A prototype carbon dioxide sensor was designed, built, and calibrated. The sensor operates by alternately comparing the infrared absorption of the air sample at 4.26 microns, where CO2 exhibits strong absorption and at 3.90 microns where it has little absorption. A two color rotating filter provides sampling 200 times per second. The unit weighs 10 pounds and has a power consumption of 70 watts. The instrument is capable of detecting a concentration of at least 0.30% CO2 and has full scale capability to 5%. (Author)

AD-614 241 Div. 16, 29
CFSTI Prices: HC$2.00 MF$0.50

Naval Medical Research Inst., Bethesda, Md.
A REVIEW OF CURRENT CONCEPTS AND PRACTICES USED TO CONTROL BODY HEAT LOSS DURING WATER IMMERSION,
by E. L. Beckman. 1964, 33p
Research rept. no. MR-005.13-4001.06, R-3

Unclassified report

Presented to the Aerospace Medical Panel General Assembly of Advisory Group for Aeronautical Research and Development (14th), held at Lisbon, Portugal, 12 Sep 64. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Protective clothing, Survival), (*Survival, Protective clothing), (*Underwater clothing, Thermal insulation), Body temperature, Hypothermia, Heat production (Biology), Tolerances (Physiology), Stress (Physiology), Water, Moisture proofing, Thermal conductivity, Woolen textiles, Synthetic rubber, Fats, Muscles, Extremeties, Swimming, Gloves, Shoes, Exposure suits.

The problem of providing adequate clothing for personnel who either during normal operations or accidentally are immersed in cold water has continued to challenge clothing manufacturers. In the past decade the development of foamed plastics and other clothing materials has offered new possibilities. Likewise advances in energy conversion and storage systems offer new solutions to this critical operational problem. The basic physical and physiological concepts which relate to the problem of limiting thermal loss from the immersed human will be reviewed. Newer technical developments in insulative clothing and supplemental heating systems will be discussed with relation to these basic concepts. (Author)

AD-614 245 Div. 16, 3, 4
CFSTI Prices: HC$1.00 MF$0.50

Army Chemical Research and Development Labs., Edgewood Arsenal, Md.
PHOTOCHEMICAL SYNTHESIS OF ANTI-ISONICOTINALDEHYDE OXIME.
Technical rept.,
by Edward J. Poziomek. Dec 64, 12p CRDLR-3250
Proj. 1A014501A91A

Unclassified report

Descriptors: (*Oximes, Synthesis (Chemistry)), (*N-heterocyclic compounds, Synthesis (Chemistry)), (*Aldehydes, Synthesis (Chemistry)), (*Photochemistry, Oximes), Molecular isomerism, Acetone, Ultraviolet radiation, Cholinesterase inhibitors, Therapy, Drugs, Pyridines.

Anti-isonicotinaldehyde oxime was prepared by irradiating an acetone solution of syn-isonicotinaldehyde oxime. This synthesis is convenient and simple and will for the first time allow various quaternary salts of the anti-isomer to be synthesized and their activities as therapeutic agents of anticholinesterase compounds to be determined. It is concluded that this photolysis procedure may be applicable to the isomerization of other heterocyclic aldoximes and their quaternary salts. (Author)

AD-614 246 Div. 16
CFSTI Prices: HC$1.00 MF$0.50

Army Chemical Research and Development Labs., Edgewood Arsenal, Md.
DPN-LINKED CYTOPLASMIC METABOLITES IN THE RAT-LEG MUSCLE, IN SITU, DURING CONTRACTION AND RECOVERY.
Rept. for Jul 63-Dec 64,
by Bertram Sacktor, Eva Wormser-Shavit, and John I. White. Apr 65, 23p CRDLR-3266
Projs. 1L013001A91A, 1C014501B71A,
Task 1C014501B71A02

Unclassified report

Descriptors: (*Nucleotides, Metabolism), (*Muscles, Metabolism), Cytoplasm, Contraction, Pyruvates, Lactates, Organic phosphorus compounds, Pyridines, Alcohols, Phosphates, Acetates, Oxygen, Oxidation, Mitochondria, Exercise, Stimulation, Rats.

The role of various metabolic pathways for mediating the oxidation of extramitochondrial reduced diphosphopyridine nucleotide (DPNH) in vivo as a function of physiological activity of leg muscle of the rat was explored. The following conclusions were reached: The DPN-linked cytoplasmic metabolites, lactate, alpha-glycerophosphate (alpha-GP), and malate, accumulate linearly during the first 100 contractions of rat-leg muscle in situ. The oxidized redox intermediate, pyruvate, also accumulates, whereas the concentrations in muscle of dihydroxyacetonephosphate (DHAP) and oxaloacetate do not change. The increase in concentration of pyruvate corresponds to that of alpha-GP, suggesting that the transfer of hydrogen from DPNH to DHAP to form alpha-GP enables pyruvate to accumulate. During the initial period of exercise, the ratio of lactate to pyruvate remains constant while that of alpha-GP to DHAP increases severalfold. With prolonged exercise, lactate and malate continue to accumulate, whereas pyruvate and alpha-GP reach a maximal titer after about 100 contractions and then decrease. During recovery after stimulation, the levels of the accumulated metabolites return to pre-stimulatory levels at independent rates. (Author)

AD-614 249 Div. 16
CFSTI Prices: HC$3.00 MF$0.75

Institute for Research in Vision, Ohio State Univ. Research Foundation, Columbus.
INFORMATION PROCESSING IN THE FROG'S RETINA.
Final rept. for 1 Sep 57-29 Feb 64,
by Leo E. Lipetz. Feb 65, 85p Rept. no. 5
Contract AF33 657 7578, Proj. 7232, Task 723203
AMRL TR-65-24

Unclassified report

Descriptors: (*Amphibians, Retina), (*Retina, Histology), Light, Stimulation, Adaptation (Physiology), Vision, Nerve cells, Ganglia, Optical images, Photoreceptors, Histological techniques, Mitochondria, Electron microscopy.

The information handling properties of the frog's retina were studied by three techniques. (a) An attempt was made to investigate the mutual interaction of excitatory and inhibitory connections to bipolar cells by studying the averaged electroretinogram response to stimulation with various patterns of light. It was found that present techniques of electroretinography and photometry did not permit the required stability of measurement. (b) Light and electron microscope studies were made of the cell types and connections of the frog's retina. Illustrative micrographs are included in the report. The new findings were made that the Landolt club of the small bipolar cell is a mitochondria-packed process and that it terminates as a cilium in the aqueous space between the visual cells. It is suggested that the function of these structures is to detect the presence of bleached, unregenerated visual pigment molecules in the surrounding visual cells. (c) A technique was developed which seems to result in selective staining of the active bipolar-ganglion cell synapses. With it functional and anatomical studies were correlated to identify the four ganglion cell anatomic types which transmit information each as to the presence in its receptive field of (1) an edge, (2) a small dark image, (3) a changing light distribution, and (4) a dimming of light intensity. (Author)

AD-614 266 Div. 16
CFSTI Prices: HC$1.00 MF$0.50

Army Chemical Research and Development Labs., Edgewood Arsenal, Md.
USE OF ISOPROTERENOL AND PHENOXYBENZAMINE IN TREATMENT OF ENDOTOXIN SHOCK,
by James A. Vick, Henry P. Ciuchta, and James H. Manthei. Apr 65, 22p CRDLR-3270
Proj. 1C522301A079

Unclassified report

Descriptors: (*Shock (Pathology), Chemotherapy), Toxins and antitoxins, Sympathomimetic agents, Sympatholytic agents, Cardiovascular system, Corticosteroid agents, Blood pressure, Acidosis, Hypotention, Stimulation, Electrocardiography, Dogs.

This report evaluates five approaches to the treatment of endotoxin shock in the dog. The effect of endotoxin on physiological parameters and survival was noted. Dogs treated with hydrocortisone, isoproterenol, or a combination of the two, showed temporary improvement; however, no significant increase in survival population was observed. Isoproterenol produced a remarkable increase in right ventricular pressure even as systemic blood pressure decreased. In contrast, hydrocortisone caused a sharp fall in both right ventricular and systemic blood pressures. Treatment with phenoxybenzamine corrected systemic acidosis, increased right ventricular output, and resulted in a 70% survival, even while arterial blood pressure was maintained at hypotensive levels. The administration of phenoxybenzamine in combination with isoproterenol produced the most remarkable results; the cardiostimulatory effect of isoproterenol compensated for the vasodilation and apparent hypotension produced by phenoxybenzamine. Flow was maintained to vital tissues, and systemic blood pressure was held at clinically acceptable levels. This combined therapy presents a possible solution to treating a seriously hypotensive condition with an agent that further reduces blood pressure. (Author)

AD-614 267 Div. 16, 3
CFSTI Prices: HC$1.00 MF$0.50

Army Chemical Research and Development Labs., Edgewood Arsenal, Md.
ELIMINATION OF SULFUR MUSTARD-INDUCED

ALKYLATION PRODUCTS FROM DNA OF ESCHERICHIA COLI,
by Bruno Papirmeister and Claire L. Davison.
Feb 65, 24p CRDLR-3260
Proj. 1A012501B028

Unclassified report

Descriptors: (*Mustard agents, Escherichia coli), (*Escherichia coli, Mustard agents), (*Desoxyribonucleic acids, Mustard agents), Viability, Degradation, Radioactivity, Chromatographic analysis, Growth, Inhibition, Genetics, Mutations, Synthesis, Therapy, Radiation effects.

The objectives of this experiment were to determine if bacteria posses a mechanism for eliminating sulfur mustard-induced damages to their deoxyribonucleic acid (DNA) and to ascertain the role of such a repair process in the recovery of cells from the effects of radiomimetic alkylating agents. This work is part of a continuing program that is designed to establish a rational approach for therapy against lethal mustard intoxications. Evidence is presented that (1) sulfur mustard-treated E. coli 15T(-)A(-)U(-) deploymerize a significant portion of their DNA during post-treatment metabolism, (2) the rate of loss of sulfur mustard products initially bound to DNA is more rapid than the rate of overall DNA degradation, (3) several sulfur mustard-DNA alkylation products (including monofunctionally and bifunctionally alkylated guanine) are eliminated to equal extents, and (4) sulfur mustard-treated bacteria after a lag recover the capacity to synthesize DNA, suggestive of a causal relationship between the excision of alkylation products from DNA and resumption of DNA replication. Because these bacteria are also capable of excising ultraviolet light-induced thymine dimers, the current results suggest that cells possess a general mechanism for repairing different types of genetic defects. (Author)

AD-614 284 Div. 16, 3
CFSTI Prices: HC$2.00 MF$0.50

Army Chemical Research and Development Labs., Edgewood Arsenal, Md.
UNBALANCED GROWTH AND LATENT KILLING OF ESCHERICHIA COLI FOLLOWING EXPOSURE TO SULFUR MUSTARD.
Rept. for Feb 62-Mar 64,
by Bruno Papirmeister and Claire L. Davison. Feb 65, 49p CRDLR-3257
Proj. 1A012501B028

Unclassified report

Descriptors: (*Escherichia coli, Mustard agents), (*Mustard agents, Escherichia coli), Metabolism, Culture media, Degradation, Immunity, Growth, Desoxyribonucleic acids, Ribonucleic acids, Radioactive isotopes, Viability, Inhibition, Synthesis, Stability, Nucleosides.

This report describes the effects of unbalanced metabolism on the survival of strains of Escherichia coli treated with sulfur mustard. Strains studied required thymine, arginine, and uracil (15T(-)A(-)U(-)) and thymine and phenylaniline (15T(-)PA(-)). Resistant bacteria incubated for 2 hr in a +T, -PA medium became progressively sensitive to sulfur mustard when transferred to a -T, -PA medium. Return to their original medium restored their original resistance. Resistant cells preincubated in +T, -AU showed higher survivals and were less susceptible to latent killing on post-treatment incubation in a -T, -AU medium. Controls in this medium remained immune to the induction of thymineless death, while mustard-treated cells showed small, dose-dependent, latent-killing effects. Pretreatment in thymidine media gave highest resistances and immunities to thymineless death. Resistant state was developed by subjecting mustard-treated cells to low levels of unbalanced metabolism. Unbalanced metabolism effects DNA and RNA stability. The monofunctional analog, beta-chloroethyl beta-hydroxyethyl sulfide, does not inhibit DNA synthesis nor promote its breakdown. Cross-alkylating reactions are effective for initiating unbalanced metabolism. (Author)

AD-614 298 Div. 16

Naval Medical Research Inst., Bethesda, Md.
IMPORTANCE OF PREVENTING RENAL VASCULAR COLLAPSE DURING PERIOD OF RENAL ISCHEMIA IN KIDNEY TRANSPLATATION,
by Eldred D. Mundth, Alfred J. DeFalco, Yorke G. Jacobson, Lawrence Brettschneider, and James E. McClenathan. 1964, 4p
Research Rept. MR-005.02-0020.01, R-4

Unclassified report

Pub. in Surgical Forum, American College of Surgeons v15 1964(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Kidneys, Transplantation), Blood vessels, Malfunctions, Etiology, Blood circulation, Pathology.

This study shows that severe renal functional impairment occurs early postoperatively in kidneys transplanted by conventional methods which allow vascular collapse in association with a period of 60 min. ischemia at 20C. This has been correlated with evidence of deficient cortical perfusion. It is proposed intrarenal vascular collapse associated with ischemia leads to the establishment of vascular shunts and decreased cortical perfusion upon re-establishment of the renal circulation. It is thought this may be the mechanism contributing to post-transplantation renal functional impairment. Maintenance of the renal intravascular volume during the period of renal ischemia has been shown to prevent post-transplant functional impairment. This evidence indicates that prevention of renal vascular collapse in the process of renal transplantation is of paramount importance to subsequent renal function. (Author)

AD-614 299 Div. 16

Naval Medical Research Inst., Bethesda, Md.
ON THE ASSIMILATION OF ENERGY FROM INORGANIC SOURCES IN AUTOTROPHIC FORMS OF LIFE,
by Lutz Kiesow. 27 Jul 64, 10p
Research Rept. MR-005.03-0301.09, R-2
Contract NASA R38

Unclassified report

Pub. in National Academy of Sciences. Proceedings v52 n4 p980-8 Oct 1964(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Metabolism, Inorganic compounds), (*Inorganic compounds, Metabolism), Energy, Thermodynamics, Adenosine phosphates, Carbon, Carbon dioxide, Synthesis, Pyridines, Nucleotides, Phosphorylation, Oxidation-reduction reactions, Bacteria.

Energy assimilation may be studied on green cells or on chemosynthetic bacteria. The latter offers one decisive advantage: in chemoautotrophs the assimilation of energy is inseparably linked to a transformation of chemical individuals. In view of these advantages Nitrobacter winogradskyi Buch was studied. The source of energy in

this species is the oxidation of nitrite to nitrate. In previous research this reaction had been demonstrated to be coupled with a reduction of DPN. The addition of DPNH and ATP to cell-free preparations of Nitrobacter resulted in the immediate assimilation of C(14) 02. Therefore, the assimilation of carbon may be considered separately as a second sequence of chemical reactions in which DPNH and ATP are utilized. This paper is concerned with the first sequence, the assimilation of energy.

AD-614 300 Div. 16

Naval Medical Research Inst., Bethesda, Md.
THE LUNG WORM ANGIOSTRONGYLUS CANTONENSIS OF RODENTS ON TAIWAN (FORMOSA) AND THE OFFSHORE ISLANDS,
by Robert E. Kuntz and Betty-June Myers. 1963, 9p Research rept. MR-005.09-1606.01, R-15
Unclassified report

Pub. in American Journal of Tropical Medicine and Hygiene v13 n5 p686-92 Sep 1964 (Copies not available to DDC or Clearinghouse customers)
Prepared in cooperation with Naval Medical Research Unit no. 2, Taipei (Taiwan) and McGill Univ., Montreal (Quebec).

Descriptors: (*Rodents, Parasitic diseases), (*Parasitic diseases, Taiwan), Epidemiology, Etiology, Lungs, Worms, Infections, Parasites, Nematodes.

Approximately 1,650 rodents (Muridae) were examined during a study of the helminth parasites of vertebrates, host-parasite relationships, and reservoir host potentials on Taiwan and the Offshore Islands. Ninety-nine of the rodents examined, including Bandicota indica nemorivaga, Rattus coxinga coxinga, R. losea, R. norvegicus, R. rattus mindanensis and R. rattus subsp. were infected with the metastrongylid lung worm, Angiostrongylus cantonensis. The parasite was found to occur on Lan-yu and in a number of localities on Taiwan. Several species have been added to the list of natural hosts. An examination of sizable population samples of rodents in several localities, and the frequency of infection with A. cantonensis in Bandicota in extensive studies at one site, suggest that host-parasite relationships may be variable and may depend on parasitological potentials in circumscribed areas. The known geographic distribution of A. cantonensis in man and in rodents is presented. Although the first human infection was recorded earlier on Taiwan, angiostrongyliasis is not currently recognized as a clinical entity on the island. Further epidemiological studies are indicated since conditions for propagation of the parasite apparently are ideal and the close association of infected rodents, intermediate hosts and the people of some of the farming communities suggest high potentials for human infection. (Author)

AD-614 302 Div. 16

Naval Medical Research Inst., Bethesda, Md.
A MONOGENETIC AND SEVEN DIGENETIC TREMATODES OF AMPHIBIANS AND REPTILES FROM PALAWAN ISLAND, PHILIPPINES,
by Jacob H. Fischthal and Robert E. Kuntz. 1963, 12p Research rept. MR005.09-1606.01-R-16
Unclassified report

Proceedings of the Helminthological Society of Washington v31 n2 p230-40 Jul 1964 (Copies not available to DDC or Clearinghouse customers.)

Descriptors: (*Platyhelminths, Morphology (Biology)), (*Trematodes, Philippines), (*Parasites, Philippines), Parasitic diseases, Amphibians, Reptiles, Hematological techniques, Preservation.

The flukes described in this report are part of a collection of parasites from Palawan Island, Republic of the Philippines. The parasites were washed in saline, killed in hot water and transferred immediately to FAA fixative. After 4-8 hours they were stored in 70 percent alcohol plus 2 percent glycerine. Staining was in Harris' hematoxylin, carmalum and fast green, or Gower's carmine. All were mounted in balsam.

AD-614 305 Div. 16

Naval Medical Field Research Lab., Camp Lejeune, N. C.
RELATIONSHIP OF RHINOVIRUS INFECTION TO MILD UPPER RESPIRATORY DISEASE. II. EPIDEMIOLOGIC OBSERVATIONS IN MALE MILITARY TRAINEES.
Vol. XV, no. 9,
by K. M. Johnson, H. H. Bloom, B. R. Forsyth, and R. M. Chanock. 28 Sep 64, 11p Rept. no. MR005.09-1204.4.15
Proj. MR005 09, Task MR005 09 1204
Unclassified report

Pub. in American Journal of Epidemiology v81 n1 p131-9 1965 (Copies not available to DDC or Clearinghouse customers.)

Descriptors: (*Virus diseases, Respiratory system), (*Respiratory diseases, Military personnel), (*Epidemiology, Military personnel), Echo virus, Infections, Antigens and antibodies, Immunity, Etiology, Pathology, Marine corps.

Two rhinoviruses, echovirus 28 and HGP, were isolated from male recruits at a military training center in the southeastern United States. Nineteen strains of E-28 and 18 strains of HGP were recovered during a 24-week period between January 9 and June 25, 1961. The viruses were apparently spread widely through the camp. E-28 virus was clearly associated with mild acute respiratory disease, whereas no such relationship was apparent with HGP. One third of the illnesses related to E-28 infection were accompanied by fever of 100 C or greater. Serologic studies revealed incidences of 62 and 65 per cent of homologous neutralizing antibodies to the viruses in acute-phase sera of virus-negative individuals. Only 4 of 32 persons from whom these agents were isolated had such antibodies, indicating that a high degree of immunity was conferred by these substances. Virus isolation and tests for neutralizing antibodies in paired sera were found to be nearly equal in sensitivity for detecting infection by both E-28 and HGP viruses. Use of both methods yielded twice as many positive results as either alone. (Author)

AD-614 306 Div. 16

Naval Medical Field Research Lab., Camp Lejeune, N. C.
PATTERNS OF ADENOVIRUS INFECTIONS IN MARINE CORPS PERSONNEL. I. A 42-MONTH SURVEY IN RECRUIT AND NON-RECRUIT POPULATIONS. II. LONGITUDINAL STUDY OF SUCCESSIVE ADVANCED RECRUIT TRAINING COMPANIES.
Vol. XV, no. 10,
by H. H. Bloom, B. R. Forsyth, K. M. Johnson, M. A. Mufson, and H. C. Turner. 8 Jun 64, 30p
Rept. no. MR005.09-1204.4.16
Proj. MR005 09, Task MR005 09 1204 Unclassified report

Pub. in The American Journal of Hygiene v80 n3 p328-42 Nov 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Adenoviruses, Epidemiology), (*Respiratory diseases, Adenoviruses), (*Epidemiology, Military personnel), Marine corps, Military training, Respiratory system, Vaccines, Tissue cultures, Immunity, Virus diseases.

Surveillance of respiratory disease in United States Marine Corps personnel over a 4-year period revealed several patterns of adenovirus infection and illness which differed from those which have been thought characteristic of military recruit populations. Respiratory illness and adenovirus infection rates were low among Marine Corps recruits at Parris Island, S. C.; adenoviruses, however, were associated with a significant proportion of those respiratory illnesses which did occur during the winter months. Extensive sharply circumscribed winter epidemics of adenovirus respiratory disease occurred when Marines subsequently underwent advanced recruit training at Camp Lejeune, N. C. During each of the 4 years of the study large-scale adenovirus epidemics at Camp Lejeune started in January and lasted through March or April. Most adenovirus infections were type 4, the remainder were type 7. During a period of time when adenovirus infection was the major cause of respiratory disease in advanced Marine recruits at the Infantry Training Regiment (ITR), Camp Lejeune, N. C., a longitudinal study of a series of training companies was performed. (Author)

AD-614 313 Div. 16

Indiana Univ., Bloomington. Dept. of Chemistry.
PEPTIDE MAPS OF ANTIBODIES AGAINST AN ANTIGEN CONTAINING TWO DIFFERENT DETERMINANT GROUPS.
by Eugene F. Gold, Katherine L. Knight, and Felix Haurowitz. 22 Oct 64, 5p
Contracts Nonr310400, AT11 1 209

Unclassified report

Pub. in Biochemical and Biophysical Research Communications v18 n1 p76-80 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Peptides, Antigens and antibodies), (*Antigens and antibodies, Peptides), Molecular structure, Chromatographic analysis, Electrophoresis, Organic nitrogen compounds, Amino acids, Arsenic compounds, Ammonium compounds, Serum albumin, Immune serums, Tissues (Biology), Rabbits.

Bovine serum albumin doubly labelled by coupling with equivalent amounts of diazotized arsanilic acid (Ars) and p-aminophenyl-N-trimethyl-ammonium chloride (R4N) was injected into rabbits. Hapten-specific antibodies against the two determinants were separated from each other and from anti-BSA. Peptide maps of anti-Ars and anti-R(4)N differ from each other only in one or two spots. Large portions of the two types of antibody molecules seem to be identical. Since both haptens are bound to the same BSA molecules, we assume that they are initially incorporated into the same cells. It is not yet known whether anti-Ars and anti-R(4)N are formed in the same cells or whether the haptens, after fragmentation of the antigen, are transferred to different antibody forming cells. (Author)

AD-614 314 Div. 16

Indiana Univ., Bloomington. Dept. of Chemistry.
SOME STUDIES ON THE SPECIFICITY OF AMINO ACID ENTRY ROUTES IN PIGEON ERYTHROCYTES,
by G. A. Vidaver, L. F. Romain, and F. Haurowitz.
11 Feb 64, 6p
Contracts Nonr310400, AT11 1 209

Unclassified report

Pub. in Archives of Biochemistry and Biophysics v107 p82-7 Jul 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Amino acids, Absorption (Biological)), (*Erythrocytes, Amino acids), Pigeons, Metabolism, Inhibition, Sodium, Potassium, Ions.

Inhibition of glycine entry into pigeon red cells by 33 amino acids, analogues, and derivatives was tested. Only N-methylglycine and N-ethylglycine inhibited glycine entry significantly. These were competitive inhibitors with ratios of inhibition constants to the Michaelis constant for glycine entry of 1.0 and 5.2, respectively. Derivatives with larger substituents on the nitrogen were essentially inactive as inhibitors, as were all the L-amino acids tested, two D-amino acids D-amino acids (D-alanine and D-leucine), and several other glycine derivatives and analogues. The glycine route entry is evidently highly specific. An L-alanine entry route of high capacity was also observed. This was insensitive to inhibition by glycine and therefore distinct from the glycine entry route. (Author)

AD-614 315 Div. 16

Naval Medical Research Lab., New London, Conn.
DENTAL OBSERVATIONS MADE WHILE WINTERING IN ANTARCTICA IN 1956-1957.
Rept. 1, Revised ed.,
by David Knoedler and William Stanmeyer. 12 Mar 58, 12p Rept. no. 302, v17 n10
Proj. NM24 01 20.06.01

Unclassified report

Pub. in Journal of Dental Research v37 n4 p614-22 Aug 1958 (Copies not available to DDC or Clearinghouse customers)
Revision of manuscript submitted 31 Aug 57.

Descriptors: (*Dentistry, Polar regions), Military personnel, Exposure, Stress (Physiology), Teeth, Diseases, Prosthetics, Mouth, Tissues (Biology), Healing, Tolerances (Physiology), Dental personnel.

Dental problems associated with exposure of personnel to the rigors of living on the Antarctic continent for over a year are numerous. Odontalgia as a result of thermal conductivity through restorations lacking or insufficient in intermediate cement bases is the most general complaint. Hypersensitive cervical dentin was sometimes controlled by preparing a shallow cavity and filling it with an insulating cement. Loss of restorations through differences of the coefficients of expansion and contraction of tooth and filling material in the cold air was not a problem. Alveolar osteitis occurred once every 4 or 5 extractions as was attributed to the exposure of the patient to the cold during the healing process. (Author)

AD-614 321 Div. 16

Army Medical Unit, Fort Detrick, Md.
STUDIES ON ANTHRAX INFECTIONS IN IMMUNIZED GUINEA PIGS,
by Martha K. Ward, Virginia G. McGann, Arthur L. Hogge, Jr., Margaret L. Huff, and Ralph G. Kanode.
13 Jul 1964, 9p

Unclassified report

Pub. in Journal of Infectious Diseases v115 p59-67 Feb 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Bacillus anthracis, Guinea pigs), (*Immunity, Bacillus anthracis), Diseases, Vaccines, Antigens and antibodies, Toxins and antitoxins, Blood analysis, Blood plasma, Spleen, Culture media, Mutations, Penicillins.

Groups of guinea pigs immunized with 1 or 3 doses of anthrax protective antigen were challenged with 2 different strains of Bacillus anthracis at 2,4 and 6 weeks after immunization. Few animals survived challenge with strain NH-6, regardless of immunization procedure or time of challenge. With the Vlb-189 challenge animals receiving 3 doses of antigen were better protected than the 1-dose group at 2 weeks after immunization, but the reverse was true at the 4-week period. Animals challenged 6 weeks after immunization rarely survived, although there was a prolonged time to death. Studies on blood, plasma, and spleen samples collected from moribund control animals and vaccinees that succumbed to challenge revealed that: (a) terminal concentrations of bacilli in blood and spleen were consistent in samples from control animals but showed wide variation in similar samples from immunized animals; (b) there was no specific correlation between prechallenge antibody titer and survival; (c) circulating toxin was rarely demonstrated in the plasma of vaccinated animals but was consistently present in the controls; and (d) most vaccinated animals (57 of 77) that succumbed to challenge had demonstrable antibody for protective antigen circulating at the time of death. Colony types differing from the parent challenge strains were observed on bicarbonate agar plates streaked with samples of blood and spleen from approximately 35% of the immunized animals. No mutants were observed from similar materials collected from untreated animals. (Author)

AD-614 332 Div. 16, 1

School of Aerospace Medicine, Brooks AFB, Tex.
FLYING STRESS IN RELATION TO FLYING PROFICIENCY,
by Henry B. Hale, John C. Duffy, James P. Ellis, Jr., and Edgar W. Williams. 1964, 5p
Unclassified report

Pub. in Aerospace Medicine v36 n2 p112-16 Feb 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Pilots, Stress (Physiology)), (*Stress (Physiology), Flight), Medical examination, Adaptation (Physiology), Urine, Levarterenol, Epinephrine, Corticosteroid agents, Urea, Uric acid, Phosphates, Potassium, Sodium, Adrenal glands, Adrenal cortex, Metabolism.

Postflight urinary determinations were employed for the purpose of evaluating flight stress in 10 pilots who were practicing bombing-strafing maneuvers. Tests were conducted in daytime and at night. Control data were obtained on nonflying days. Urinary determinations included norepinephrine, epinephrine, 17-hydroxy-corticosteroids, creatinine, urea, uric acid, phosphate, potassium and sodium. By the use of this battery of determinations it was possible to appraise flight-sensitivity in sympatho-adrenal, adrenocortical and metabolic activities. The results give good leads for further research and suggest that flying proficiency is high when endocrine-metabolic displacement (physiologic cost) is low. These observations also indicate that stress reactions to flight conform to the General Adaptation Syndrome pattern. (Author)

AD-614 333 Div. 16

School of Aerospace Medicine, Brooks AFB, Tex.
METHYLENE BLUE IN THE TREATMENT OF DECABORANE TOXICITY,
by John A. Merritt, Jr. 25 Aug 64, 3p
Unclassified report

Pub. in Archives of Environmental Health v10 p452-4 Mar 1965.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Decaboranes, Toxicity), (*Methylene blue, Decaboranes), Therapy, Parenteral infusions, Injection (Medicine), Oxidation, Rabbits.

Adult rabbits continuously infused intravenously with 5% dextrose were given 30 mg per kg of decaborane dissolved in 4 ml of corn oil intraperitoneally. After 20 minutes methylene blue (7 mg per kg) was given in 5% dextrose over a 60-minute period followed by an infusion of dilute methylene blue for 47 hours. All of the animals treated with methylene blue as described above lived longer than 24 hours and half lived longer than 48 hours. All of the untreated rabbits died in less than 24 hours. Since the high energy fuel decaborane is a potent reducing agent, it seems likely that the oxidizing capacity of methylene blue accounts for its effect. It is suggested that this form of therapy would be more useful than previous empirical treatment of boron hydride toxicity. (Author)

AD-614 334 Div. 16

School of Aerospace Medicine, Brooks AFB, Tex.
PAROTID FLUID FLOW RATE, PAROTID FLUID, AND SERUM INORGANIC PHOSPHATE CONCENTRATIONS AS RELATED TO DENTAL CARIES STATUS IN MAN,
by Ira L. Shannon. 1964, 10p
Unclassified report

Pub. in Journal of Dental Research v43 n6 pt1 p1029-38 Nov-Dec 1964.
(Copies not available to DDC or Clearinghouse customers).

Descriptors; (*Salivary glands, Dentistry), (*Teeth, Diseases), (*Phosphates, Teeth), Saliva, Excretion, Blood serum, Tables.

Inorganic phosphate determinations were carried out on blood serum and parotid fluid obtained with no exogenous stimulation from 514 healthy young adult males classified as to dental caries status (DMFS). No significant differences were found in flow rate or serum inorganic phosphate concentration of the six DMFS groups. Parotid fluid inorganic phosphate concentration was inversely related to dental caries experience, this relationship becoming particularly significant when subjects with DMFS rates of 40 or less were compared to those participants with rates of more than 40. There is no diagnostic significance in this observation at the present time. (Author)

AD-614 337 Div. 16

Armed Forces Inst. of Pathology, Army Medical Center, Washington, D. C.
SPONGY DEGENERATION OF THE NERVOUS SYSTEM; A REPORT OF FOUR CASES WITH A REVIEW OF THE LITERATURE,
by Darrell S. Buchanan and Richard L. Davis. 1963, 16p
Unclassified report

Pub. in Neurology v15 n3 Mar 65 (Copies not available to DDC or Clearinghouse customers).
Research done in cooperation with Walter Reed Army Medical Center, Washington, D. C.

Descriptors: (*Nervous system, Degradation), (*Pathology, Nervous system), Brain, Diseases, Histology, Children, Diagnosis, Blindness, Convulsive disorders, Cerebral cortex, Cerebellum, Cerebrum, Motor reactions, Cells (Biology), Etiology, Mental disorders.

The clinical and pathological findings in 4 cases of spongy degeneration of the nervous system are presented. Analysis of the 26 reported cases, 16 with histological data, reveals these patients to be a highly homogeneous group, both clinically and histologically. The disease has its onset in the first 10 months of life, affects both sexes equally, is familial, and occurs most frequently in Jewish people. The major clinical findings are severe motor and mental retardation with blindness and macrocephaly. Atony is a frequent early finding, with progression to a rigid decerebrate state. There is a high incidence of tremor, involuntary movements, convulsions, and extensor spasm. The course is progressive, with death usually occurring before 3 years of age. It is concluded that the disease represents a failure of proper myelin formation rather than a demyelinating process. Spongy degeneration of the nervous system is believed to be a nosologic entity which should be considered in any case of infantile amaurotic idiocy when there is no macular lesion and especially when macrocephaly is a component of the clinical picture. (Author)

AD-614 339 Div. 16

Auditory Research Labs., Princeton Univ., N. J.
AUDITORY RESPONSES IN THE ALLIGATOR LIZARD,
by David E. Crowley. 1964, 9p
Unclassified report

Pub. in Journal of Auditory Research v4 p135-43 1964 (Copies not available to DDC or Clearinghouse customers).
Research supported in part by Public Health Service and Office of Naval Research, Washington, D. C.

Descriptors: (*Reptiles, Auditory perception), (*Auditory perception, Reptiles), Ear, Stimulation, Audiofrequency, Intensity, Sound.

A study of four specimens of the foothill alligator lizard, Gerrhonotus multicarinatus, by the cochlear potential method revealed an ear maximally sensitive to tones below 1000 cycles with sensitivity rapidly falling off for higher frequencies. The irregular nature of the intensity functions suggests the operation of a mechanism that protects the inner ear from overstimulation. The possibility that the columella system plays a role in such a process was tentatively substantiated, in that sectioning the columella made the intensity functions slightly more regular. For all frequencies tested, the maximum values obtained for the cochlea responses under conditions of increased sound pressure were low. In this connection and as an explanation of irregularity of the intensity functions in general it is suggested that the noise limitations of the recording equipment make it impossible to obtain the linear portions of the curves. (Author)

AD-614 340 Div. 16

Auditory Research Labs., Princeton Univ., N. J.
FURTHER STUDIES OF HEARING IN THE GEKKONID LIZARDS,
by Ernest Glen Wever, Ernest A. Peterson, David E. Crowley, and Jack A. Vernon. 12 Feb 64, 8p
Unclassified report

Pub. in National Academy of Sciences. Proceedings v51 n4 p561-7 Apr 1964 (Copies not available to DDC or Clearinghouse customers)
Supported by National Institute of Neurological Diseases and Blindness, U. S. Public Health Service, Office of Naval Research, and by Higgins funds allotted to Princeton.

Descriptors: (*Reptiles, Auditory perception), (*Auditory perception, Reptiles), Hearing, Ear, Audiofrequency, Sound, Stimulation.

The study of hearing in the lizards has been extended to two further species of geckos, the warty gecko Hemidactylus turcicus turcicus and the banded gecko Coleonyx variegatus bogerti. The sensitivity curves of these species are distinctive, yet follow the general form that has been found for most lizards. A consideration of the forms of the intensity functions for various tones, and the values of the maximum potentials obtained, lead to the conclusion that tones of different frequency involve the cochlear hair cells in somewhat different response patterns. The frequency differentiation is far less than that of mammalian ears, but is sufficient to indicate that the basic conditions responsible for such differentiation are already present in this primitive ear. (Author)

AD-614 341 Div. 16, 4

Walter Reed Army Inst. of Research, Washington, D. C.
COULOMETRIC DETERMINATION OF PROTEIN NITROGEN,
by Gary D. Christian, Edward C. Knoblock, and William C. Purdy. 15 Sep 64, 9p
Unclassified report

Pub. in Clinical Chemistry (U. S.) v11 n3 p413-21 Mar 1965 (Copies not available to DDC or Clearinghouse customers).
Prepared in cooperation with Maryland Univ., College Park. Dept. of Chemistry.
Presented at the Annual Meeting of the Federation of American Societies for Experimental Biology (48th) Apr 12-17, 1964, Chicago, Ill.

Descriptors: (*Proteins, Volumetric analysis), (*Nitrogen, Volumetric analysis), Ammonia, Blood serum, Decomposition, Sulfuric acid, Electrochemistry.

A coulometric method is described for the determination of ammonia resulting from micro-Kjeldahl digestion of protein samples. The method has been applied to the direct titration of the ammonia in the digests. Routine titration of the ammonia resulting from 10 micron-L. serum samples is described; the method has been applied to 1 micro-L. samples. Results are compared with standard macro- and micro-Kjeldahl procedures. (Author)

AD-614 342 Div. 16

Walter Reed Army Inst. of Research, Washington, D. C.
THE EFFECT OF DEXTRAN ON PLATELET FACTOR 3 ACTIVITY IN VITRO AND IN VIVO STUDIES,
by Roger A. Ewald, James W. Eichelberger, Jr., Allen A. Young, Harvey J. Weiss, and William H. Crosby. 23 Jul 64, 11p
Unclassified report

Pub. in Transfusion v5 n2 p109-19 Mar-Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Dextran, Blood coagulation), (*Blood coagulation, Inhibition), (*Blood platelets, Dextran), Blood transfusions, Hemolysis, Ultrasonic radiation, Prothrombin, Corticosteroid agents, Blood serum.

Intravenous infusions of one liter of low molecular weight and standard clinical dextran in normal adult subjects resulted in a significant alteration of platelet function as characterized by marked depression of platelet factor 3 (PF 3) activity. Disruption of the abnormal platelets by sonic oscillation corrected the defect, indicating that dextran coating of the platelets inhibited the release of PF 3 activity. These findings were confirmed by in vitro studies. The platelet abnormality was related to the plasma dextran concentration and the retention of large dextran molecules in the circulation. Clinical dextran had a more deleterious effect on PF 3 activity than low molecular weight dextran. The results of these experiments indicate that dextran coating of platelets interferes with the release of PF 3 activity, and suggest that alteration of the platelet surface may modify other platelet functions involved in maintaining a normal bleeding time. (Author)

AD-614 343 Div. 16, 25

Walter Reed Army Inst. of Research, Washington, D. C.
ELECTRON SPIN RESONANCE CHARACTERISTICS OF SOME NORMAL TISSUES: EFFECT OF MICROWAVE POWER,
by Harold M. Swartz and Robert P. Molenda.
4 Feb 65, 2p

Unclassified report

Pub. in Science v148 n3666 p94-5 Apr 2 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Spectroscopy, Tissues (Biology)), (*Tissues (Biology), Paramagnetic resonance), (*Paramagnetic resonance, Tissues (Biology)), Microwave spectroscopy, Free radicals, Organic compounds, Liver, Heart, Lungs, Paramagnetic materials, Cryogenics.

Electron spin resonance measurements of normal tissue at 77K indicate the presence of two types of resonances which can be identified by varying the incident microwave power: (i) an intense, easily saturable, organic free-radical component and (ii) a weak but relatively nonsaturating component probably due to paramagnetic trace elements. (Author)

AD-614 344 Div. 16

Walter Reed Army Inst. of Research, Washington, D. C.
EVALUATION OF ELECTRONIC MEASUREMENTS OF HEMAGGLUTINATION FOR QUANTITATIVE STUDIES. I. LIMITATIONS IN THE APPLICATION OF INSTRUMENT MEASUREMENTS,
by Mary B. Gibbs. 12 Jun 64, 7p

Unclassified report

Pub. in Journal of Immunology v94 n1 p55-61 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Agglutinins, Counting methods), (*Blood groups, Agglutinins), Electronic equipment, Measurement, Antigens and antibodies, Erythrocytes, Immunity, Immune serums, ABO incompatibility, Blood transfusions, Distribution.

The results of an extensive study of the use of total particle measurements obtained by an electronic cell counter for quantitative hemagglutination purposes are presented. Total particle data were shown to yield nonlinear log probit and logit log assay curves. The free cell to total particle relationship was shown to differ with the avidity of the serum and the strength of the antigen on the red cell within a system, and with the pattern of aggregation among blood group systems. It is therefore doubtful that total particle measurements have any useful application in quantitative hemagglutination assay systems. (Author)

AD-614 345 Div. 16

Walter Reed Army Inst. of Research, Washington, D. C.
EXTENT OF ANTIGENIC VARIATION OF A2 INFLUENZA VIRUSES FROM PROTOTYPE STRAINS,
by H. L. Weinberger, E. L. Buescher, and V. M. Edwards. 10 Jun 64, 8p

Unclassified report

Pub. in Journal of Immunology v94 n1 p47-54 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Influenza virus, Antigens and antibodies), Antigen - antibody reactions, Immunity, Immune serums, Epidemiology, Tissue culture, Infections, United States.

Application of the cell culture neutralization (N) test demonstrates that representative strains of the 1963 A2 variant are antigenically homogeneous. Reaction patterns of individual antisera clearly show the differences between the 1957 strain and the current family of A2 viruses. None of these differences could be demonstrated by hemagglutination-inhibiting (HI) test alone. The analysis of the patterns of incidence of N antibody in recruit populations lends laboratory support to the epidemiologic descriptions of the progression of the 1963 epidemic across the United States. Despite the presence of considerable N antibody to both the 1957 and 1963 strains of virus, 47 cases of A2 virus infection were confirmed in 1963. The tenuous correlation between humoral antibody to influenza and immunity has been discussed. (Author)

AD-614 346 Div. 16

Walter Reed Army Inst. of Research, Washington, D. C.
METABOLIC RESPONSES DURING MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG,
by Ray A. Olsson and Donald E. Gregg. 22 Jun 64, 6p

Unclassified report

Pub. in American Journal of Physiology v208 n2 p231-6 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cardiovascular diseases, Oxygen consumption), (*Blood volume, Metabolism), (*Oxygen consumption, Blood volume), (*Heart, Obstruction (Physiology)), Flowmeters, Anoxia, Cardiovascular system, Blood circulation, Lactates, Pyruvates, Dogs.

Studies of myocardial metabolism during reactive hyperemia in unanesthetized dogs reveals that A-V oxygen difference is consistently decreased during reactive hyperemia. Myocardial oxygen consumption rate is increased, however, as the increase in coronary blood flow rate is greater than the decrease in A-V oxygen difference. Oxygen debt is always, though variably, overpaid. Studies of A-V lactate and pyruvate differences show that occlusions of more than 6 sec regularly lead to lactate production, while occlusions shorter than this do not. It is suggested that myocardial reactive hyperemia is a metabolic response to a metabolite produced by even mild degrees of anoxia. The effects of this metabolite on coronary blood flow appear to be out of proportion to the anoxic stimulus. (Author)

AD-614 347 Div. 16

Walter Reed Army Inst. of Research, Washington, D. C.
MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG,
by Ray A. Olsson and Donald E. Gregg. 22 Jun 64, 8p
Unclassified report

Pub. in American Journal of Physiology v208 n2 p224-30 Feb 1965 (Copies not available to DDC or Clearinghouse customers).
Preliminary report presented at the International Symposium on Autoregulation of Blood Flow, in Indianapolis, Ind., 10-12 Jun 63.

Descriptors: (*Cardiovascular diseases, Oxygen consumption), (*Blood volume, Metabolism), (*Oxygen consumption, Blood volume), (*Heart, Obstruction (Physiology)), Blood circulation, Flowmeters, Surgery, Anoxia, Cardiovascular system, Dogs.

Studies of myocardial reactive hyperemia in dogs 5-24 days after the implantation of electromagnetic flowmeters on coronary artery branches reveal that the duration of occlusion and the control flow rate are independent determinants of the volume of reactive hyperemia flow. Flow debt is almost always overpaid, the average figure being 500 ± 200%. Phasic coronary flow curves show an increase in both systolic and diastolic flow during reactive hyperemia, the increase in systolic flow being due in part to decreased myocardial contractility. Myocardial reactive hyperemia is thought to be due to the accumulation of vasodilator metabolites during the period of coronary occlusion. (Author)

AD-614 348 Div. 16

Walter Reed Army Inst. of Research, Washington, D. C.
THE NATURE OF ANTIBODIES FOLLOWING EXPERIMENTAL ARBOVIRUS INFECTION IN GUINEA PIGS,
by Joseph A. Bellanti, Sudie B. Russ, George E. Holmes, and Edward L. Buescher. 1 Jun 64, 11p
Unclassified report

Pub. in Journal of Immunology v94 n1 p1-11 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Arboviruses, Antigens and antibodies), Immunity, Infections, Herpes simplex virus, Parainfluenza virus, Russian spring summer encephalitis virus, Japanese B encephalitis virus, Chromatographic analysis, Electrophoresis, Gamma globulin, Agglutinins, Inhibition, Guinea pigs.

Following experimental infection of guinea pigs with Japanese encephalitis and Russian spring-summer encephalitis viruses, complement-fixing (CF), hemagglutination-inhibiting (HI) and neutralizing (N) antibodies are regularly formed by the 7th to the 10th days. Characterization of these antibodies at various times over a 4-month period revealed that CF antibody was invariable associated with a 7 S gamma 2-globulin; there was no evidence of an early 19 S complement-fixing antibody. The earliest detectable HI and N antibodies at 7 to 10 days were largely associated with a 19 S gamma-globulin; after 14 days, these activities were found in the 7 S gamma 1- and gamma 2-globulin moieties. These data are interpreted to indicate that following experimental infection with these arboviruses, antibody is produced with different physicochemical properties which may account for the temporal dissociation of antibody responses seen following infection. (Author)

AD-614 349 Div. 16

Walter Reed Army Inst. of Research, Washington, D. C.
PULMONARY MICROTHROMBI,
by Robert M. Hardaway. 1964, 8p
Unclassified report

Pub. in Pulmonary Embolic Disease p65-72 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Lungs, Thrombosis), (*Thrombosis, Lungs), Pathology, Blood coagulation, Arteries, Veins, Capillaries, Cardiovascular diseases, Hemorrhage, Hypertension, Blood volume, Shock (Pathology), Obstruction (Physiology), Heart, Histology, Diagnosis, Therapy.

AD-614 353 Div. 16

Temple Univ., Philadelphia, Pa. School of Medicine.
DIFFERENTIATION OF NEVOID BASAL CELL CARCINOMA FROM EPITHELIOMA ADENOIDES SYSTICUM; A CLINICOPATHOLOGIC AND HISTOCHEMICAL STUDY,
by James H. Graham, J. K. Mason, Howard R. Gray, and Elson B. Helwig. 22 Apr 64, 4p
Grant PHS 2A5289C2
Unclassified report

Pub. in Journal of Investigative Dermatology v44 n3 p197-200 1965 (Copies not available to DDC or Clearinghouse customers).
Rept. presented at the Annual Meeting of the American Academy of Dermatology (22nd), Symposium on Cutaneous Tumors, Chicago, Ill., 3 Dec 63.

Descriptors: (*Cancer, Histology), (*Neoplasms, Histology), Pathology, Histological techniques, Diagnosis, Bone, Ulcers, Mucopolysaccharides.

The lesions from patients with nevoid basal cell carcinoma are histologically and histochemically indistinguishable from the various patterns and types of basal cell carcinoma. Overlapping features are present in lesions of epithelioma adenoides cysticum of Brooke; but critical evaluation of the clinical, histopathologic, and histochemical changes separate these diseases into two distinct entities. (Author)

AD-614 355 Div. 16

Walter Reed Army Inst. of Research, Washington, D. C.
THAM DIALYSIS: AN EXPERIMENTAL METHOD TO STUDY DIFFUSION OF CERTAIN WEAK ACIDS IN VIVIO. II. SECOBARBITAL,
by James P. Knochel and Kevin G. Barry.
16 Jul 64, 10p
Unclassified report

Pub. in Journal of Laboratory and Clinical Medicine v65 n3 p361-9 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Barbiturates, Diffusion), (*Peritoneum, Permeability), Membranes (Biology), Ph, Ionization, Metabolism, Absorption (Biological), Blood chemistry, Acid-base equilibrium, Body fluids, Dogs.

Barbiturates are weak acids and, accordingly, dissociate into ionized and nonionized species when in a solution of appropriate pH. In general, biologic

membranes are more permeable to nonionized barbituric acid derivatives than their ionized species. In accordance with the principle of nonionic diffusion, if a hydrogen-ion gradient exists between two sides of a permeable biologic membrane, certain barbiturates will become concentrated on the alkaline side at equilibrium. Therefore, it was postualted that by sustaining an alkaline pH in the peritoneal fluid, nonionized secobarbital diffusing passively a gradient for the undissociated drug, with a net increase in the peritoneal extraction of secobarbital. Two groups of dogs were deeply anesthetized with secobarbital and dialyzed against a solution which contained tris-(hydroxymethyl) amino-methane (THAM) and a standard nonbuffered solution. It was found that THAM maintained a high pH gradient across the peritoneum and augmented the extraction of secobarbital more than tenfold. There was no apparent local or systemic harmful effects in the dogs dialyzed with THAM. (Author)

AD-614 362 Div. 16, 28

Princeton Univ., N. J.
EVOKED RESPONSE LATENCY AS A FUNCTION OF STIMULUS RISE-TIME IN THE AUDITORY CORTEX,
by James E. Pugh. 1962, 5p
Unclassified report

Pub. in Journal of Auditory Research v4 p145-9 1964
(Copies not available to DDC or Clearinghouse customers)
Supported by grants from National Institute of Neurological Diseases and Blindness, Public Health Service, and a contract from Office of Naval Research, and by Higgins Funds allotted to Princeton Univ.

Descriptors: (*Auditory perception, Measurement), Auditory signals, Audiofrequency, Stimulation, Reaction (Psychology), Nerve cells, Intensity, Cats.

The latency of evoked potentials from the auditory cortex of the cat is reduced when the rate of rise of the stimulating tone is increased. The change in latency varies slightly with the intensity level of the stimulus. For strong tones, a decrease in rise time (increase of rate of rise) from 40 to 6 milliseconds reduces the latency by a factor of three, whereas for weaker tones this same change reduces the latency by a factor close to four. These results support the view that the auditory system is in some sense a rate detector. (Author)

AD-614 370 Div. 16

Electrical Engineering Research Lab., Univ. of Illinois, Urbana.
THE EFFECT OF ULTRASOUND ON BIOLOGICAL TISSUE.
Final rept. for 1 Jan 58-29 Feb 64,
by Elizabeth Kelly, William J. Fry, and Francis J. Fry. 1964, 80p
Contract Nonr183420, Proj. NR101 075
Unclassified report

Also includes: Present and Future Applications of Ultrasonics in Biomedicine; pub. in Proceedings of the IRE v50 n5 p1393-1404. Muscle Twitch Tension. Influence of Electrical Stimulating conditions at Different Temperatures. I. Results for Chloride Ringer's. Muscle Twitch Tension. Influence of Electrical Stimulating Conditions at Different Temperatures. II. Results for Nitrate Ringer's; pub. in Physics in medicine and Biology v9 n3/4 p371-88/559-67 Jul-Oct 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Tissues (Biology), Ultrasonic radiation), (*Ultrasonic radiation, Tissues (Biology)), Cells (Biology), Pituitary gland, Central nervous system, Biophysics, Electronic equipment, Stimulation, Muscles, Contraction, Medical equipment.

The broad aim of the project was to determine and study the effects of ultrasonic energy on biological tissue and to use this radiation to investigate both the cellular and intracellular organization and structure of biological systems.

AD-614 394 Div. 16, 12
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
COSMIC HORIZONS OF ANABIOSIS,
by N. Timofeev. 30 Mar 65, 10p FTD-TT-65-72
TT 65-62070
Unclassified report

Unedited rough draft trans. of Nauka i Zhizn' (USSR) v31 n2 p54-7 1964.

Descriptors: (*Closed ecological systems, Space flight), (*Space crews, Hibernation), Hypothermia, Acceleration tolerance, Space biology.

A popularized article on hibernation of space crews as a method for making long space flights is presented.

AD-614 403 Div. 16, 28
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
THE INFLUENCE OF CERTAIN PHARMACOLOGICAL PREPARATIONS ON THE BIOELECTRIC ACTIVITY OF THE BRAIN IN SCHIZOPHRENIA,
by A. L. Gamburg and A. M. Denisova.
20 Apr 65, 18p FTD-TT-65-388
TT 65-62060
Unclassified report

Unedited rough draft trans. of Zhurnal Nevropatologii i Psikhiatrii (USSR) v64 n1 p116-24 1964.

Descriptors: (*Pharmacology, Mental disorders), (*Mental disorders, Pharmacology), (*Psychotropic agents, Electroencephalography), Brain, Psychiatry, Drugs, Epinephrine, Acetylcholine, Atropine, Dosage, Adrenocorticotropic hormone, Corticosteroid agents, Autonomic nervous system, Central nervous system, Pathology, USSR.

Utilizing 51 schizophrenic patients and 9 normal subjects, studies were conducted on modifications of the bioelectric activity of the brain in the course of pharmacological tests. By means of EEG indications, some troubles of basic activity were proved with certain patients, and also the character of response to doses of extraordinary excitants. Modifications of biopotentials after the injection of adrenalin, acetylcholine or atropine into the patients were very different than those observed with the normal subjects. At the same time, adrenalin and atropine as well as corticotropine, cortisone, desoicortisone or thyreoidine, eliminate in a selective manner, certain pathological elements of the EEG in certain forms of schizophrenia. Acetylcholine caused evident pathological modifications in the EEG. Once such effect of the medications used has been partially explained by their influence on the adrenergic and

cholinergic systems. The results of the research, according to the authors, can facilitate the analysis of pathogenic mechanisms and the research for means of normalization of the reaction of cerebral structures in schizophrenia. (Author)

AD-614 440 Div. 16, 25
CFSTI Prices: HC$1.00 MF$0.50

Michigan State Univ., East Lansing. Dept. of Biophysics.
THE ELECTRICAL CONDUCTIVITY OF PROTEINS IN THE SOLID STATE.
Status rept. for 1 Jun-1 Dec 64.
1 Dec 64, 12p
Contract Nonr258706

Unclassified report

Descriptors: (*Proteins, Electrical conductance), Solid state physics, Hydrates, Semiconductors, Tritium, Tritiated compounds, Crystals, Frequency, Hall effect, Hemoglobin, Temperature, Conductivity, Electrometers, Voltage, Electrical impedance, Electrochemistry.

The research project described sets up three separate experimental approaches designed to answer the following basic questions concerning the electrical conductivity of proteins in the solid state: (A) What are the charge carriers in dry proteins, (electronic or ionic). (B) What are the charge carriers in hydrated proteins, (electronic or ionic). (C) How does the hydration state of the protein determine the magnitude of the semiconduction process. (D) What is the sign of the predominant charge carriers. (E) What is the mobility of the charge carriers. (F) What is the temperature dependence of the charge carrier density.

AD-614 478 Div. 16
CFSTI Prices: HC$2.00 MF$0.50

Edinburgh Univ. (Scotland).
SMOOTH MUSCLE RESPONSES AS ALTERED BY HUMORAL BACKGROUND.
Final scientific rept.,
by L. M. Pickford. 31 Dec 64, 26p
Grant AF EOAR62 79
AFOSR 65-0664

Unclassified report

Descriptors: (*Pituitary hormones, Vasoactive agents), (*Vasoactive agents, Pituitary hormones), Blood vessels, Muscles, Epinephrine, Levarterenol, Autonomic nervous system, Stimulation, Estrogens, Atropine, Pregnancy, Sex glands, Reproduction (Physiology), Females, Males, Monkeys, Rats, Dogs, Great Britain.

In man, monkey, rat and dog oxytocin normally has a vasodilator effect. Following surgical or chemical sympathetic denervation oxytocin becomes a vasoconstrictor. The dilator effect can be restored by infusing adrenaline or stimulating the sympathetic nerves. Oxytocin also becomes a vasoconstrictor when the circulating concentration of oestrogens is raised either naturally in the presence of oestrogens (as in rats in oestrus) or experimentally. In dogs the dilator response to oxytocin can be restored by giving atropine, and then either infusing adrenaline or stimulating the sympathetic nervous system. (Author)

AD-614 479 Div. 16
CFSTI Prices: HC$1.00 MF$0.50

Leicester Univ. (England).

THE METABOLISM OF SIMPLE CARBON COMPOUNDS IN MICRO-ORGANISMS.
Final rept.,
by H. L. Kornberg. 1 Jan 65, 22p Grant AF EOAR63 17
AFOSR 65-0665

Unclassified report

Descriptors: (*Bacteria, Metabolism), (*Metabolism, Carbon compounds), Microorganisms, Mutations, Growth, Chromosomes, Enzymes, Coenzymes, Citrates, Biosynthesis, Carboxy-lyases, Organic phosphorus compounds, Pyruvates, Amino acids, Hexoses, Synthesis, Molecular weight, Escherichia coli, Clostridium, Pseudomonas, Great Britain.

This report summarizes the evidence for the views that (a) the structural gene for citrate synthase adjoins that for galactokinase on the chromosome of E. coli; (b) the anaplerotic carboxylation of C3-acids in E. coli is effected via phosphopyruvate carboxylase; this reaction is regulated by acetyl-coenzyme A; (c) the functioning of isocitrate lyase is causally related to growth on acetate; (d) the activation of an L-serine dehydratase by its substrate is associated with a change in the molecular weight of the enzyme; (e) erythro beta-Hydroxyaspartate dehydratase, highly purified, differs from other hydroxyaminoacid dehydratases; (f) P. ovalis Chester contains a highly active oxaloacetate 4-carboxylyase, which is inhibited by acetyl-coenzyme A derivatives; (g) Cl. kluyveri extracts catalyse the ferredoxin-dependent carboxylation of acetyl-coenzyme A. In addition, a number of matters relevant to these major areas of work are discussed. (Author)

AD-614 486 Div. 16

Harvard Univ., Cambridge, Mass.
CODING AND TRANSMISSION IN THE VISUAL SYSTEM.
Final scientific rept.,
by David H. Hubel. 1 Mar 65, 9p
Grant AF AFOSR410 63, Proj. 9777, Task 9777 01
AFOSR 65-0458

Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Vision, Cats), (*Color vision, Monkeys), Visual perception, Eye, Anomalies, Damage, Sensory deprivation, Stimulation, Histology, Cells (Biology), Recovery.

The research performed was mainly in the field of single-cell recordings from cat and monkey visual areas. The chief areas explored were (1) monkey lateral geniculate recordings using stimuli of various shapes and colors, and (2) a continuation of work on visual deprivation in immature kittens. Summaries of 3 papers which treat the extension of this work into problems of binocular deprivation, strabismus, and recovery are included. A summary is also included for studies of visual areas II and III in cats (Talbot and Marshall, 1941). The following conclusions are given: (1)Damage produced at the cortical level by monocular closure is not caused by disuse, but appears to depend on the interaction of the 2 pathways; (2) lack of synergy in the input from the 2 eyes is sufficient to cause a profound disruption in the connections that subserve binocular interaction; and (3) capacity of an animal to recover from the effects of early monocular or binocular visual deprivation is severely limited, even for recovery periods of over a year. (Author)

AD-614 508 Div. 16

Prairie Regional Lab., Saskatoon (Saskatchewan).

BIOSYNTHESIS OF MUSTARD OIL GLUCOSIDES: V. FORMATION OF GLUCONASTURTIIN FROM L-GAMMA-PHENYLBUTYRINE-C(14)-N(15) IN WATERCRESS,
by E. W. Underhill. 12 Aug 64, 9p
Unclassified report

Pub. in Canadian Journal of Biochemistry v43 p179-87 1965.
Copies available only to DDC users.

Descriptors: (*Plants (Botany), Glycosides), (*Glycosides, Biosynthesis), Metabolism, Labeled substances, Fatty acids, Phenylalanine, Amino acids, Canada.

C(14)-Labelled compounds were fed to watercress (Nasturtium officinale R. Br.) and their efficiency as precursors of the aglycone portion of gluconasturtiin compared. Phenylalanine-2- and -3-C(14) and sodium acetate-2-C(14) were efficient precursors of the aglycone but neither compound was as efficient a precursor as gamma-phenylbutyrine (2-amino-4-phenylbutyric acid). Approximately 40% of the C(14) from gamma-phenylbutyrine-2- or -3-C(14) was incorporated into the aglycone side chain. Results of studies with doubly labelled L-gamma-phenylbutyrine-C(14)-N(15) show that theamine nitrogen is incorporated directly into the thioglucoside. Evidence that indicates that D-gamma-phenylbutyrine is converted to its L-isomer by the plant is also presented. The results of an isotope competition experiment provide some evidence for the existence of a chain-lengthening pathway (analogous to the formation of leucine from valine) for the biosynthesis of gamma-phenylbutyrine from phenylalanine and acetate in watercress. (Author)

AD-614 510 Div. 16

Centre d'Etudes de Physiologie Nerveuse et d'Electrophysiologie, Paris (France).
EVOKED ACTIVITY IN THE CAUDATE NUCLEUS OF THE CAT IN RESPONSE TO VARIOUS KINDS OF AFFERENT STIMULI. I. MACROPHYSIOLOGICAL STUDY (Activites Evoquees dans le Noyau Caude du Chat en Reponse a des Types Divers d'Afferences. I. Etude Macrophysiologique,
by D. Albe-Fessard, E. Oswaldo-Cruz, and C. Rocha-Miranda. 19 May 59, 17p
Contract AF61 052 103
AFOSR TN-60-1314
Unclassified report

Pub. in Electroencephalography and Clinical Neurophysiology Journal v12 n2 p405-20 May 60.
Copies available only to DDC customers.
Text in French.

Descriptors: (*Brain, Stimulation), (*Sensory perception, Brain), Visual signals, Auditory signals, Smell, Cerebral cortex, Thalamus, Nervous system, Physiology, Cats, France.

Long-latency potentials of large amplitude are evoked in the region of the caudate nucleus by somatic, visual, auditory and olfactory stimulation either in anesthetised or non-anesthetised animals. Afferents are relayed through reticular formation, zona incerta, c. medianum, n. centralis medialis. The caudate responses were not spatially organized relative to the nature and locus of stimulation, they lacked a somatotopic arrangement. They were not modified by extensive ablation of cerebral and cerebellar cortex. Responses of short latency were elicited by motor cortex stimulation. (Author)

AD-614 511 Div. 16

Prairie Regional Lab., Saskatoon (Saskatchewan).
BIOSYNTHESIS OF THE COUMARINS. VI. FURTHER STUDIES ON HERNIARIN FORMATION IN LAVENDER,
by Stewart A. Brown. 3 Aug 64, 9p NRC-8231
Unclassified report

Pub. in Canadian Journal of Biochemistry v43 p199-207 1965 (Copies available only to DDC users).

Descriptors: (*Coumarins, Biosynthesis), Plants (Botany), Glycosides, Hydrolysis, Labeled substances, Tracer studies, Canada.

Analyses of lavender plants, with careful precautions to avoid enzymic hydrolysis, have shown that herniarin exists in the plant at least 99% in a bound form, presumably cis-2-glucosyloxy-4-methoxycinnamic acid (cis-GMC). Traces of a glycoside of 2-hydroxy-4-methoxycinnamic acid (HMC), which appears identical with trans-GMC, have also been identified. Several pieces of evidence, principally the failure to demonstrate conversion of p-coumaric acid to p-methoxycinnamic acid by a trapping technique, now indicate that the latter compound, although an efficient precursor of herniarin when administered, may not be a natural intermediate in herniarin formation. O-Methylation, therefore, may occur at a later stage. Feedings of C(14)-labelled HMC have shown that it is converted to herniarin about one-fifth as efficiently as trans-GMC, the best herniarin precursor yet found. Trapping experiments with C(14)-labelled p-coumaric or p-methoxycinnamic acid and nonradioactive HMC demonstrated conversion of both labelled compounds to free HMC and to a bound form hydrolyzable with emulsin, presumably trans-GMC. The consistently higher specific activity of the bound HMC in these experiments suggests that free HMC, contrary to earlier assumptions, may not be an intermediate in the formation of bound HMC. Syntheses of herniarin-1-C(14) and HMC-carboxy-C(14) are described. (Author)

AD-614 512 Div. 16

Prairie Regional Lab., Saskatoon (Saskatchewan).
BIOSYNTHESIS OF MUSTARD OIL GLUCOSIDES. VI. BIOSYNTHESIS OF GLUCOBARBARIN IN RESEDA LUTEOLA L,
by E. W. Underhill. 12 Aug 64, 10p NRC-8235
Unclassified report

Pub. in Canadian Journal of Biochemistry v43 p189-98 1965
(Copies available only to DDC users).

Descriptors: (*Plants (Botany), Glycosides), (*Glycosides, Biosynthesis), Metabolism, Fatty acids, Amino acids, Phenylalanine, Acetates, Labeled substances, Canada.

A number of C(14)-labelled compounds were fed to Reseda luteola L.; after a 24-hour period of metabolism, the thioglucoside aglycone (5-phenyl-2-oxazolidinethione) was isolated and its specific activity determined. In some instances the aglycone was degraded to determine the distribution of C(14). DL-gamma-Phenylbutyrine (2-amino-4-phenylbutyric acid) was the most efficient precursor of the aglycone, followed by phenylalanine and acetate; the carboxyl carbon of these compounds was not incorporated into the thioglucoside aglycone. Little or no randomization of C(14) in the aglycone resulted from feeding DL-gamma-phenylbutyrine-2- and -3-C(14), DL-phenylalanine-2- and -3-C(14), and acetate-2-C(14). The conversion of C(14) from 10 additional compounds into the aglycone was less than that from D-glucose-G-C(14). Isotope competition experiments suggest that beta-benzylmalic acid also may be a precursor. It appears that the C6-C3 aglycone is formed from phenylalanine and acetate via C6-C5

and C6-C4 intermediates (including gamma-phenylbutyrine or its keto acid analogue) in a manner analogous to the formation of gluconasturtiin in watercress. The carbon-14 and nitrogen-15 of L-phenylalanine-G-C(14)-N(15) and of DL-gamma-phenylbutyrine-2-C(14)-N(15) were not incorporated as a unit into the aglycone of glucobarbarin. (Author)

AD-614 514 Div. 16

National Research Council of Canada, Ottawa (Ontario). Div. of Biosciences.
N-ACETYL GROUPS IN VITELLENIN,
by J. Z. Augustyniak and W. G. Martin. 23 Oct 64, 2p NRC-8246

Unclassified report

Pub. in Canadian Journal of Biochemistry v43 p291-2 1965 (Copies available only to DDC users).

Descriptors: (*Phosphoproteins, Amines), (*Amines, Phosphoproteins), Amino acids, Lipids, Carbohydrates, Eggs, Chromatographic analysis, Canada.

The presence of acetyl groups in vitellenin was confirmed by hydrazinolysis according to the DNP method of Phillips. After hydrazinolysis of 10-30 mg of vitellenin at 100C for 17 hours, acetic acid DNP-hydrazide was identified by chromatography. Since no trace of this hydrazide was found after hydrazinolysis at room temperature for 1 hour, vitellenin contains N-acetyl, but no O-acetyl, groups. (Author)

AD-614 521 Div. 16

National Research Council of Canada, Ottawa (Ontario). Div. of Biosciences.
A RIBOSOMAL PEPTIDASE FROM ESCHERICHIA COLI B,
by A. T. Matheson and C. S. Tsai. 5 Oct 64, 7p NRC-8279

Unclassified report

Pub. in Canadian Journal of Biochemistry v43 p323-9 1965 (Copies available only to DDC users).

Descriptors: (*Escherichia coli, Enzymes), (*Enzymes, Escherichia coli), Ribosomes, Peptides, Sucrose, Proteins, Solubility, Electrophoresis, Canada.

Properties of a peptidase present in E. coli ribosomes have been studied. The enzyme is tightly bound to the ribosomes, as indicated by repeated washings and centrifugations, and electrophoresis on cellulose acetate. The level of enzyme activity in the 30 S particles is twice that found in the 50 S particles. When the ribosome structure is disrupted by enzymic or chemical means, the peptidase behaves similarly to the bulk of the ribosomal protein. (Author)

AD-614 522 Div. 16

Chicago Univ., Ill.
RELATIONSHIP BETWEEN ACTIVITY OF PYRUVATE KINASE AND AGE OF THE NORMAL HUMAN ERYTHROCYTE,
by Robin D. Powell and Richard L. DeGowin. 1965, 3p
Contract DA49 193md2413

Unclassified report

Pub. in Nature v205 n4970 p507 Jan 30 1965 (Copies available only to DDC users).

Descriptors: (*Erythrocytes, Aging (Physiology)), Pyruvates, Adenosine phosphates, Glycolysis, Saccharide phosphates, Blood counts, Blood platelets, Leukocytes, Enzymes.

AD-614 561 Div. 16

Pennsylvania Univ., Philadelphia. School of Medicine.
WATER AND ELECTROLYTE CONTENT OF NORMAL AND HYPERTENSIVE ARTERIES IN DOGS,
by Allan W. Jones, Eric O. Feigl, and Lysle H. Peterson. 20 Apr 64, 8p
Contract Nonr55118; Grant PHS HE07762

Unclassified report

Pub. in Circulation Research v15 p386-92 Nov 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hypertension, Electrolytes (Physiology)), (*Electrolytes (Physiology), Hypertension), (*Arteries, Electrolytes (Physiology)), Potassium, Sodium, Chlorides, Aorta, Muscles, Water, Dogs.

This study was designed to establish values for the water and electrolyte content along the arterial tree in the dog under normal conditions and to determine how the normal electrolyte pattern was altered in renal phypertension. Determinations of vessel wall water, potassium, sodium, and chloride contents have shown that the water and electrolyte contents from the various sites along the arterial tree differ significantly from each other. Total water and potassium contents decrease progressively from the ascending aorta to the femoral and carotid sites, while the sodium and chloride contents showed the opposite trend. These differences were significant statistically. These trends may not persist along the entire vascular tree to very small arteries, as indicated by analysis of mesenteric arterial samples. Studies of vessel wall inulin space supported the view that these differences result from the relative distribution of cellular and noncellular material; thus the proximal aorta contains a relatively greater proportion of cellular (smooth muscle) material than more distal sites such as the femoral and carotid arteries. A review of the literature further supports these findings. In experimentally induced renal hypertension the same trends persist along the aorta, but the total water and sodium contents are significantly elevated at all sites. (Author)

17. Metallurgy

AD-613 931 Div. 17

Alloyd General Corp., Cambridge, Mass.
THE DIMENSIONAL STABILITY OF SELECTED ALLOY SYSTEMS.
Final rept. for 1 Jun 63-31 Aug 64,
by P. F. Weihrauch and M. J. Hordon. 31 Aug 64, 94p
Contract N140 131 75098B

Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Creep, Alloys), (*Iron alloys, Stability), (*Nickel alloys, Stability), (*Stainless steel, Stability), (*Aluminum alloys, Stability), (*Magnesium alloys, Stability), Elasticity, Stresses, Strain (Mechanics), Alloys, Storage, Distortion, Temperature, Tests.

Elastic limits, elastic moduli, stress-total strain and stress-plastic strain curves were determined for free cutting Invar 36, 356-T6 aluminum, 310 stainless steel, 6061 aluminum and AZ92A magnesium at 75,150 and 200F. The creep behavior of these alloys was studied at the same temperatures of interest at stresses above, below and at the elastic limit. In all cases it was found that the precision elastic limit did not define the minimum stress to cause creep, in fact creep took place at stresses below the elastic limit at a much reduced rate. The data was analyzed in the light of current creep theory and micro-yield theory. A dislocation model was used to derive analytic expressions for creep near the 1000000 elastic limit stress. Below the elastic limit creep was found to follow an exponential time dependence, while above the elastic limit a t(n) time dependence was followed with values of n from 1/3 to 1/2. The dimensional changes taking place in these alloys under storage conditions at the three temperatures of interest is also presented. (Author)

AD-613 952 Div. 17, 26
CFSTI Prices: HC$3.00 MF$0.75

Nuclear Metals, Inc., Concord, Mass.
BERYLLIUM RESEARCH AND DEVELOPMENT PROGRAM. VOLUME VI. INFLUENCE OF THE DISTRIBUTION OF OXIDE AND THE TOTAL IMPURITY LEVEL ON RECRYSTALLIZATION AND GRAIN GROWTH OF BERYLLIUM.
Final rept. for 1 Oct 61-1 Oct 63,
by J. Moriceau, J. M. Logerot, M. Croutzeilles, A. Saulnier, and R. Syre. Feb 65, 98p
Contract AF33 616 7065, Proj. 7351, Task 735104
ASD TDR-62-509 V6

Unclassified report

Subcontracted to Pechiney Co., Chambery (France). See also AD-604 599.

Descriptors: (*Beryllium, Powder metallurgy), (*Powder metallurgy, Beryllium), (*Impurities, Beryllium), Oxides, Recrystallization, Grain structures (Metallurgy), Transition temperature, Heat treatment, Powder metals, Hot working, Forging, Rolling (Metallurgy), Metallography, Microstructure, Tensile properties, Sheets, Mechanical properties, Ductility.

Conclusions are: (a) Increase of the impurity content in beryllium raises the recrystallization temperature and decreases the tendency for grain growth by restraining the movement of grain boundaries. (b) At high levels of deformation, the distribution of oxide does not seem to be fundamentally different for the material originating from the different types of powder. (c) The layers of oxide effectively restrain the motion of grain boundaries to the point of making grain growth negligible but do not always constitute an insurmountable barrier for these boundaries. (d) In all cases, the conditions of fabrication play a fundamental role in the subsequent behavior of the metal, especially with respect to the mechanical properties.

AD-613 957 Div. 17
CFSTI Prices: HC$1.00 MF$0.50

Defense Metals Information Center, Columbus, Ohio.
STRESS-CORROSION CRACKING OF ALUMINUM ALLOYS,
by James D. Jackson and Walter K. Boyd.
15 Feb 65, 20p Memo. no. DMIC-M-202
Contract AF33 615 1121, Proj. 8975

Unclassified report

Descriptors: (*Aluminum alloys, Corrosion), (*Corrosion, Stresses), Fracture (Mechanics), Heat treatment, Environmental tests, Coatings, Corrosion inhibition.

This memorandum summarizes information submitted in response to a questionnaire distributed by the Aerospace Research and Testing Committee of the Aerospace Industries Association of America. Aluminum alloys most often associated with stress-corrosion cracking in actual service are 2014, 2024, 2219, 7075, 7079, and 7178 alloys, and cast alloys of Ternalloy 7, 40E, 195, and 220 compositions. The tensile stresses necessary to initiate stress-corrosion cracking may be either (1) applied (as through static loads, press fits, or fasteners), or (2) residual (such as from heat treatment or machining). The prevention of failure requires a basic knowledge of the phenomenon and of the relative resistance of the various alloys, and of the effect of grain structure on cracking susceptibility. Application of this knowledge and use of good practices in heat treatment, working, forming, machining, and design can reduce the incidence of stress corrosion. The application of compressive stresses such as by shot peening or the use of coatings offers an effective means of minimizing or at least delaying stress-corrosion cracking. Laboratory investigations of stress-corrosion cracking often involve C-ring or tensile specimens exposed by alternate immersion in 3-1/2 percent NaCl solution. (Author)

AD-613 969 Div. 17

Pressure Technology Corp. of America, Woodbridge, N. J.
AN INVESTIGATION OF Be AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
Engineering progress rept. no. 5, 7 Sep-7 Nov 64,
7 Nov 64, 10p
Contract NOw64 0180c

Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Beryllium, Deformation), (*Tungsten, Deformation), Tensile properties, Extrusion, Tests, Pressure, Ductility, Powder metallury, Sheets, High pressure research.

Fluid-to-fluid extrusion of hot-pressed beryllium was continued. Reductions up to 40% were made. Tensile tests under pressure of hot-pressed beryllium were performed. A Rebinder Effect appears to be present for Be. Working the Be enhances its strength considerably. Bending tests under pressure were made on W sheet. In general, increasing pressure increases permissible bend angle. (Author)

AD-613 970 Div. 17
CFSTI Prices: HC$1.00 MF$0.50

Stanford Univ., Calif. Dept. of Materials Science.
GRAIN BOUNDARY SEGREGATION AND THE COLD WORK PEAK IN IRON CONTAINING CARBON OR NITROGEN,
by Mervyn L. Rudee and Robert A. Huggins.
Mar 65, 25p Technical rept. no. TR-16, SU-DMS-65-13
Contract Nonr22534, Proj. NR031 577

Unclassified report

Descriptors: (*Iron, Impurities), Nitrogen, Carbon, Grain boundaries, Electron microscopy, Internal friction, Crystal lattice defects.

Samples of iron containing 0.07 weight % nitrogen or 0.015 weight % carbon have been given treatments similar to those used in cold work peak (CWP) measurements and examined by transmission electron microscopy. It was observed that the unusual and non-reproducible behavior of the carbon CWP can be explained by a strong tendency for carbon to form grain boundary precipitates at temperatures below those used for CWP measurements. These precipitates dissolved at the temperatures used in the CWP measurements. There was no evidence for nitrogen precipitation at grain boundaries. There was no indication of precipitation along dislocations in either carburized or nitrided samples given treatments similar to those of CWP measurements. Although it is possible that sub-electron-microscopic clustering had occurred, this observation supports the theories of the CWP that are based on continuous atmospheres rather than on individual precipitates. (Author)

AD-613 971 Div. 17, 25
CFSTI Prices: HC$2.00 MF$0.50

Stanford Univ., Calif. Dept. of Materials Science.
INFLUENCE OF A FINELY DISPERSED SECOND PHASE ON RECRYSTALLIZATION,
by John L. Brimhall, Mark J. Klein, and Robert A. Huggins. Feb 65, 38p
Technical rept. no. TR-15, SU-DMS-65-11
Contract Nonr22534, Proj. NR031 577

Unclassified report

Descriptors: (*Silver alloys, Recrystallization), (*Copper alloys, Recrystallization), (*Recrystallization, Heat treatment), Dispersion hardening, Particles, Magnesium alloys, Aluminum alloys, Oxides, Electron microscopy, Microstructure, Crystal lattice defects, Grain structure (Methallurgy), Grain boundaries, Deformation, Alloys, Phase studies.

The annealing behavior of internally oxidized alloys of silver containing magnesium and copper containing aluminum was studied by transmission electron microscopy. In agreement with observations on pure materials, annealing of the dispersion-hardened alloys involves the formation of subgrains from the cell structure and the subsequent growth of the subgrains into the matrix. The kinetics of both subgrain formation and growth are extremely slow in the dispersion-containing alloys, compared to pure silver and copper. This retardation could be attributed to the nature of the deformed structure, which does not contain regions of severe plastic curvature. As a result, the formation of mobile interfaces by misorientation accumulation is difficult. Particle interaction with dislocation motion during subgrain formation and direct particle interaction with the migrating subgrain boundaries during growth are discussed. (Author)

AD-614 009 Div. 17, 25
CFSTI Prices: HC$1.00 MF$0.50

Manlabs, Inc., Cambridge, Mass.
THERMODYNAMICS OF MARTENSITIC F. C. C. reversibly yields B. C. C. AND F. C. C. reversibly yields H. C. P. TRANSFORMATIONS IN THE IRON-RUTHENIUM SYSTEM,
by Larry Kaufman. Mar 65, 25p
Technical rept. no. TR-9
Contract Nonr260000

Unclassified report

Will be published as part of the Proceedings of a Conference on Physical Metallurgy of Martensite and Bainite, to be held 10-12 May 1965 in Scarborough, England.

Descriptors: (*Crystal structure, Martinsite), (*Martensite, Transformations), (*Iron alloys, Ruthenium alloys), (*Ruthenium alloys, Iron alloys), Thermodynamics, Crystal lattices, Numerical analysis, Phase studies.

A thermodynamic analysis of the iron-ruthenium system has been performed on the basis of the regular solution model by approximating the lattice stability of h. c. p., f. c. c. and b. c. c. ruthenium as being similar to non-magnetic iron. The analysis permits calculation of the entire phase diagram, the T sub (o)-x curves for diffusionless f. c. c. reversibly yields b. c. c. and f. c. c. reversibly yields h. c. p. reactions at one atmosphere and the compositional dependence of the f. c. c./b. c. c. h. c. p. pressure-temperature triple points, all of which compare reasonably well with observation. The driving force for the martensitic f. c. c. reversibly yields b. c. c. reaction is temperature dependent and similar to that observed for iron-nickel alloys. The driving force for the martensitic f. c. c. reversibly yields h. c. p. reaction is about 50 cal/mole and, as expected from crystallographic considerations, is smaller than the corresponding f. c. c. reversibly yields b. c. c. driving force. (Author)

AD-614 017 Div. 17
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
INVESTIGATING OXIDATIONS OF NIOBIUM-TITANIUM-ZIRCONIUM ALLOYS,
by D. A. Prokoshkin, E. V. Vasil'eva, and A. M. Ryabyshev. 26 Mar 65, 11p FTD-TT-64-1037
TT 65-61989

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR, Institut Metallurgii, Moscow. Trudy n13 p157-62 1963.

Descriptors: (*Niobium alloys, High temperature research), (*Oxidation, Niobium alloys), (*Titanium alloys, Oxidation), (*Zirconium alloys, Oxidation), Scale, Diffusion, Oxygen.

The oxidation kinetics of niobium base alloys with constant titanium content of (5 and 10 weight %) was investigated in air at 1000, 1200C. The zirconium content in the test alloys varied between 0.5 - 25 weight %. It was established, that addition of zirconium to niobium/titanium alloys in amount of up to 5 weight % causes an increase in their rate of oxidation. A further increase in zirconium content gives a reduction in rate of oxidation at all investigated temperatures. Alloys with 5 weight % of Ti at all temperatures and zirconium concentrations had a somewhat higher rate of oxidation, than alloys with 10 weight % of Ti. An x-ray

structural analysis was made of alloy scales, the results of which enabled one to establish, that a reduction in rate of oxidation of alloys, containing more than 5 weight % of Zr, is due to the formation in the scale of a 6Zr2.Nb2O5 compound. The rate of oxygen diffusion through the lattice of this compound apparently, is considerably lower than through the lattice of niobium/titanium alloys. (Author)

AD-614 019 Div. 17, 30

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
STUDYING MECHANICAL AND THERMAL FATIGUE OF METALS BY THE INTERNAL FRICTION METHOD,
by V. S. Postnik, I. V. Zolotukhin, and G. A. Gorshkov. 26 Mar 65, 16p FTD-TT-64-1046 TT 65-61991
Unclassified report

Unedited rough draft trans. of mono. Tsiklicheskaya Prochnost' Metallov, Moscow p218-26 1962. Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Metals, Fatigue (Mechanics)), (*Fatigue (Mechanics), Internal friction), (*Internal friction, Metals), Cadmium, Zinc, Aluminum, Gold, Thermal stresses, Deformation, Test methods, USSR.

The report represents the first effort of using the internal friction method to study mechanical and thermal fatigue of materials. For the beginning were selected pure metals: cadmium, zinc, aluminum and gold. Of the possible internal friction measuring methods for our purpose we used the low frequency method of torsional oscillations of low amplitude. The frequency of oscillations of the sample 100 mm long, profile 0.7 - 1 sq mm, was equal approximately to 1 c. As a measure of internal friction was used the logarithmic damping decrement, divided by pi. All measurements on the first pores were made w/o the use of vacuum i.e. in the air. (Author)

AD-614 080 Div. 17, 25
CFSTI Prices: HC$2.00 MF$0.50

Stanford Univ., Calif. Dept. of Materials Science.
STRUCTURE OF DEFORMED INTERNALLY OXIDIZED ALLOYS,
by John L. Brimhall and Robert A. Huggins.
Feb 65, 32p Technical rept. no. TR-14, SU-DMS-65-3
Contract Nonr22534, Proj. NR031 577
Unclassified report

See also AD-613 971.

Descriptors: (*Silver alloys, Crystal lattice defects), (*Copper alloys, Crystal lattice defects), Magnesium alloys, Aluminum alloys, Oxides, Electron microscopy, Deformation, Dispersion hardening, Microstructure, Strain (Mechanics), Particles.

The structure of deformed internally oxidized alloys of silver containing magnesium and copper containing aluminum were studied by thin film transmission electron microscopy. With low to moderate amounts of strain, the deformation structure in the dispersion-hardened alloys was found to consist of a high density of dislocations arranged in a random distribution or in a very fine, but poorly defined, cell structure, depending on the fineness of the dispersion and amount of deformation. In contrast, both pure copper and silver show relatively large, distinct cell structures. The particular structures in the alloys are believed to result from particles acting as both dislocation sources and deflectors. The lack of a pronounced deformation texture and regions of severe local plastic curvature after heavy deformation can also be traced to the formation of dislocations on many slip systems and a lack of local concentrations of dislocations of predominantly one sign. (Author)

AD-614 086 Div. 17, 26

Pressure Technology Corp. of America, Woodbridge, N. J.
AN INVESTIGATION OF BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
Engineering progress rept. no. 4, 7 Jul-7 Sep 64. 1964, 14p
Contract NOw64 0180c Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.
See also AD-613 969.

Descriptors: (*Beryllium, Deformation), (*Tungsten, Deformation), Powder metallurgy, High-pressure research, Sheets, Tensile properties, Castings, Extrusion, Tests, Crystals, Ductility, Fracture (Mechanics).

Bending tests were conducted on hot-pressed beryllium sheet. In general, higher pressures increased the permissible bend angle for such sheet. Tensile tests under pressure were made on cast-and-hot-extruded Be. Tensile tests under pressure were also run on several types of polycrystalline W, and on single crystals of W. (Author)

AD-614 115 Div. 17
CFSTI Prices: HC$1.00 MF$0.50

Watervliet Arsenal, N. Y.
THE BAUSCHINGER EFFECT IN A HIGH STRENGTH STEEL.
Final technical rept.,
by Rex V. Milligan, William H. Koo, and Thomas E. Davidson. Mar 65, 34p Rept. no. WVT-6508 Proj. 1L0 13001A91A
Unclassified report

Descriptors: (*Steel, Strain (Mechanics)), (*Strain (Mechanics), Steel), Deformation, Martensite, Pearlite, Bainite, Elasticity, Plasticity.

The object of this work was to quantitatively evaluate the Bauschinger Effect in a 4330 modified steel as a function of strength level and structure as derived from variations in heat treatment. Material having martensitic, pearlitic, and bainitic structures was studied utilizing a uniaxial tension-compression specimen. Various ways of defining the magnitude of the Bauschinger Effect are explained. One is a conventional approach as suggested by Welter, the other a technique which takes strain hardening into account. The results show the Bauschinger Effect to be independent of yield strength for three different strength levels of the martensitic material. It is only mildly influenced by material structure and indepenent of the direction of overstrain. The Bauschinger Effect increases with increasing permanent strain up to approximately 2% and thereafter remains essentially constant. (Author)

AD-614 128 Div. 17, 26

Pressure Technology Corp. of America, Woodbridge, N. J.
AN INVESTIGATION OF Be AND W ALTERED BY HIGH-

PRESSURE DEFORMATION.
Engineering progress rept. no. 3, 7 May-7 Jul 64.
7 Jul 64, 7p
Contract NOw64 0180c

Unclassified report

Available only for reference at DDC Field Services.
Copy is not available for public sale.
See also AD-614 129.

Descriptors: (*Beryllium, Deformation), (*Tungsten, Deformation), Tensile properties, Tests, High-pressure research, Powder metallurgy, Extrusion, Single crystals, Fracture (Mechanics).

Tensile tests were conducted on polycrystalline beryllium. Reduction in area in excess of 80% was noted for hot-pressed Be. Fluid-to-fluid extrusion was performed successfully on single crystal tungsten. (Author)

AD-614 129 Div. 17, 26

Pressure Technology Corp. of America, Woodbridge, N. J.
AN INVESTIGATION OF Be AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
Engineering progress rept. no. 2, 7 Mar-7 May 64.
7 May 64, 10p
Contract NOw64 0180c

Unclassified report

Available only for reference at DDC Field Services.
Copy is not available for public sale.
See also AD-614 128.

Descriptors: (*Beryllium, Deformation), (*Tungsten, Deformation), Tensile properties, Extrusion, Ductility, High-pressure research, Tests, Powder metallurgy, Fracture (Mechanics).

Tensile tests have been conducted on polycrystalline beryllium and tungsten, and fluid-to-fluid extrusion on polycrystalline beryllium. Ductility was observed in beryllium at pressures of about 300,000 psi. (Author)

AD-614 182 Div. 17, 9, 25

Toronto Univ. (Ontario).
THERMAL CONVECTION DURING HORIZONTAL SOLIDIFICATION OF PURE METALS AND ALLOYS.
Revised ed.,
by G. S. Cole and W. C. Winegard. 7 Jan 64, 12p

Unclassified report

Pub. in Journal of the Institute of Metals v93 p153-64 1964-1965 (Copies available only to DDC users).
Revision of manuscript submitted 12 Aug 63.

Descriptors: (*Phase studies, Liquid metals), (*Metals, Crystallization), (*Alloys, Crystallization), Heat transfer, Surface properties, Crystal growth, Boundary layer, Partial differential equations, Temperature, Freezing.

Temperature fluctuations have been observed by sensitive thermocouples placed in intimate contact with the liquid during the horizontal and unidirectional solidification of pure metals and alloys. These fluctuations are caused by the presence of thermal convection in the liquid as the result of a temperature gradient. The amount of thermal convection is shown to be a function of the temperature gradient in the liquid, the rate of solidification, the height of the solid/liquid interface, the angle of deviation of the interface from the vertical plane, and the fluid parameters of the liquid metal. The presence of thermal convection during the horizontal growth of alloy crystals may affect the steady-state solute distribution in the liquid to cause macroscopic segregation. (Author)

AD-614 236 Div. 17, 26

Pressure Technology Corp. of America, Woodbridge, N. J.
AN INVESTIGATION OF Be AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
Engineering progress rept. no. 1, 7 Jan-7 Mar 64.
7 Mar 64, 23p
Contract NOw64 0180c
N64 32652

Unclassified report

Available only for reference use at DDC Field Services.
Copy is not available for public sale.
See also AD-614 128.

Descriptors: (*Beryllium, Deformation), (*Tungsten, Deformation), Tensile properties, Tests, High-pressure research, Extrusion, Cold working, Powder metallurgy.

Materials were procured of Be and W for tensile tests and fluid-to-fluid extrusion. Specimens were prepared for test, and apparatus is ready to begin deformation experimentation. A literature survey was made of cold deformation of Be and W. (Author)

AD-614 318 Div. 17, 25

Lincoln Lab., Mass. Inst. of Tech., Lexington.
RAPID-FREEZE METHOD FOR GROWTH OF BISMUTH SINGLE CRYSTALS,
by Sidney Fischler. 1964, 2p Rept. no. MS-895
Contract AF19 628 500

Unclassified report

Pub. in Transactions of the Metallurgical Society of AIME v230 p340-1 Mar 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Bismuth, Single crystals), (*Crystal growth, Freezing), (*Single crystals, Crystal growth), Zone melting, Crystallization.

Large striation-free single crystals of bismuth have been grown from the melt by rapid freezing. Zone-refined bismuth, together with doping impurities if desired, is placed in a shallow flat-bottomed graphite boat and melted in air with a propane hand torch. The torch is then withdrawn in a manner which causes the melt to freeze directionally. Crystallization, which requires only a few minutes, usually results in the formation of a single crystal even when a seed crystal is not used. Crystals of any desired orientation may be grown by using oriented seeds. Undoped crystals grown by this method have residual resistivity ratios (rho sub 300K/rho 4.2K) greater than 200. (Author)

AD-614 387 Div. 17
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
X-RAY EXAMINATION OF THE ORDERING PROCESS IN ALLOYS,
by V. I. Iveronova. 1 Apr 65, 14p
FTD-TT-64-1056
TT 65-62063

Unclassified report

Unedited rough draft trans. of Ukrayins'kyi Fizychnyi Zhurnal (USSR) v8 n2 p157-62 1963.

Descriptors: (*Alloys, Atomic structure), (*X-ray photography, Alloys), Grain structures (Metallurgy), Metallography, Crystal lattices, USSR.

AD-614 390 Div. 17
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
NEW 5KhGSVF FORGING STEEL,
by G. S. Keilin and T. A. Sitnikova. 30 Mar 65, 8p
FTD-TT-65-37
TT 65-62066

Unclassified report

Unedited rough draft trans. of Meditsinskaya Promyshlennost' SSSR, v18 n1 p47-8 1964.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Steel, Dies), (*Dies, Forging), USSR, Tool Steel, Metallurgy, Hardness, Heat treatment, Wear resistance.

5KhGSVF steel completely satisfies the high requirements placed upon steels for hammer dies and is a full-value replacement for nickel steels 5KhNV, 5KhNM, 5KhNT. 5KhGSVF steel assures a significant saving in scarce nickel (15 - 19 kg per ton) as compared with nickel die steels. Die steel 5KhGSVF must be recommended for wide application in factories of the medical-instrument industry. (Author)

AD-614 405 Div. 17
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
SETTLING-OUT OF COBALT FROM LEAN SOLUTIONS WITH SODIUM SULFIDE,
by Yu. A. Yablonskii and V. I. Smirnov. 26 Apr 65, 13p FTD-TT-65-390
TT 65-62059 Unclassified report

Unedited rough draft trans. of Ural'skii Politekhnicheskii Institut, Sverdlovsk. Trudy, v134 p46-53 1963.

Descriptors: (*Cobalt, Chemical precipitation), (*Separation, Cobalt), (*Sodium compounds, Sulfides), USSR, Nickel, Manganese, Iron, Solutions, Sulfuric acid, Ores (Metal sources), Refining (Metallurgy).

Sodium sulfide appears to be an inexpensive generally accessible reagent for the settling out of cobalt and nickel from manganese and iron contaminated sulfuric acid solutions, obtained in the process of hydrometallurgical treating of oxidized iron ores and other materials, containing cobalt. The processing of cobalt solutions with sodium sulfide allows to extract into the residue about 94-98% of cobalt and 86-98% of Ni. Settling out of cobalt and nickel with sodium sulfide appears to be a simultaneous operation of cleansing the cobalt from manganese, because the ratio Co : Mn changes from 0.1 in solution to 25-35 in concentrate. A technology of applying sodium sulfide for the settling out of cobalt testing under semi-industrial conditions is presented. (Author)

AD-614 422 Div. 17
CFSTI Prices: HC$1.00 MF$0.50

Frankford Arsenal, Philadelphia, Pa. Research and Development Directorate.
SILICON AND ZINC EFFECT ON MAGNESIUM-LITHIUM AND MAGNESIUM-LITHIUM-SILVER ALLOYS,
Technical research article,
by Anthony Saia and Ralph E. Edelman. Dec 64, 12p
Rept. no. A64-29
Proj. 1C024401A328 Unclassified report

Reprinted from Vol. 72, 1964 Transactions, and December 1964 Modern Castings.

Descriptors: (*Magnesium alloys, Casting alloys), (*Silicon, Additives), Lithium alloys, Silver alloys, Zinc alloys, Tensile properties, Microstructure, Aging (Materials), Deformation, Grain structures (Metallurgy), X-ray diffraction analysis, Magnesium compounds, Silicon compounds, Heat treatment.

Small amounts of silicon were added to magnesium-lithium lightweight alloys and it was found this increased ultimate tensile strength in binary, ternary, and quaternary, strengthened the matrix, and refined grain size. (Author)

AD-614 447 Div. 17
CFSTI Prices: HC$2.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge. Dept. of Metallurgy.
THE ROLE OF CARBON AND FINE STRUCTURE IN THE HARDENING OF IRON-NICKEL-CARBON MARTENSITES,
by Marc H. Richman and Morris Cohen. 27 Apr 65, 32p Technical rept. no. TR-10
Contract Nonr184135

Unclassified report

Descriptors: (*Martensite, Hardening), (*Iron alloys, Nickel alloys), (*Steel, Martensite), Carbon alloys, Hardness, Transformations, Electron microscopy, Crystal lattice defects, Transition temperature, Metallography.

The internal twins in iron-nickel and iron-nickel-carbon martensites have been measured by transmission electron microscopy under a number of conditions. The mean twin thickness is 57 ± 5 A, and the mean twin spacing is 97 ± 5 A, independent of the carbon content, M sub s temperature, and whether the martensite is formed athermally or isothermally (by electrolytic thinning of the specimen). The ratio of these two parameters is in line with that predicted for an invariant-plane transformation, indicating that the internal twins come into existence as an integral part of the martensitic transformation. Notwithstanding the constancy of the twin dimensions, the hardness of these martensites increases in the usual way with carbon content. Hence, a solid-solution hardening model is proposed to account for the carbon-dependent strengthening of virgin martensite. A reasonable explanation is obtained through interactions between dislocations and random carbon atoms, assuming a parabolic-hyperbolic potential well and an interaction energy of 0.5 eV. (Author)

AD-614 462 Div. 17
CFSTI Prices: HC$2.00 MF$0.50

Technische Hochschule, Vienna (Austria).
INVESTIGATORS OF THE SYSTEMS Y-Mn, Gd-Mn AND Sm-Mn,
by F. Lihl. 31 Jan 64, 38p
Scientific rept. no. SR-7
Contract AF61 052 609

Unclassified report

Descriptors: (*Rare earth elements, Alloys), (*Manganese alloys, Rare earth elements), (*Ytterium, Manganese alloys), (*Gadolinium, Manganese alloys), (*Samarium, Manganese alloys), Powder alloys, Preparation, Intermetallic compounds, Transition temperature, Magnetic properties, Crystal lattices, Austria.

The mechanism of alloy formation by the amalgam process was studied. It is very likely that at low temperatures

manganese metal is formed from the RE-Mn amalgams. This manganese metal is coexistent with the compounds REHg2 and REHg. At higher temperatures (700 - 800C) RE-metal is formed from the RE-Hg compounds. The two intimately mixed, fine powdered metals react, yielding the RE-Mn-compounds. The systems Y-Mn, Gd-Mn and Sm-Mn was studied. The compounds YMn2, GdMn2, SmMn2, YMn4, SmMn4, GdMn4 and YMn12 were prepared. Their lattice spacings were evaluated. The amalgam process is very advantageous for preparing RE-Mn alloys and compounds at temperatures below the melting points of the components. The magnetic transition temperatures (Curie-points) of the ferromagnetic compounds REMn4 were established (YMn4: 219C; GdMn4: 192C; SmMn4: 170C).

AD-614 464 Div. 17, 4, 25
CFSTI Prices: HC$3.00 MF$0.75

Technische Hochschule, Vienna (Austria).
A SINTER PROCESS, USING MERCURY AS AN 'AUXILIARY COMPONENT' AS APPLIED TO RE-Mn SYSTEMS. (A SUMMARIZING DISCUSSION). DIFFERENTIAL-THERMAL- AND MAGNETO-THERMAL-ANALYSIS OF THE SYSTEM Gd-Mn (0 - 50 w.% Mn),
by F. Lihl. 31 Jul 64, 62p Scientific rept. no. SR-9
Contract AF61 052 609

Unclassified report

Descriptors: (*Rare earth elements, Alloys), (*Manganese alloys, Rare earth elements), (*Sintering, Rare earth elements), High temperature research, Powder alloys, Phase studies, Gadolinium, Magnetic properties, Quantitative analysis, Austria, Distillation, Microstructure.

A summarizing discussion of the 'amalgam process' is given which turned out to lead to equilibrium states even at higher temperatures than 300 - 400 C. Applying the 'amalgam process' to higher temperatures (800 - 1200 C) the mercury, bound by the respective RE-metals, plays the role of an 'auxiliary component'. The amalgam process is the main step of a very particular sinter process. The distillation of mercury out of the amalgam yields intimately mixtures of very fine and reactive powders of RE- and Mn-metal. The different steps of the sinter process are described in detail as well as the results gained applying this alloying method to the RE (Gd, Sm, Dy, Ho, Er)-Mn systems. By means of newly developed methods for differential thermal analysis (DTA) and magnetothermal analysis of small amounts of high reactive materials, especially the system Gd-Mn was studied and a partial phase diagram (0 - 50 w.% Gd) is given.

AD-614 465 Div. 17, 30
CFSTI Prices: HC$3.00 MF$0.75

Technische Hohcschule, Vienna (Austria).
THEORIES OF THE DIFFERENTIAL-THERMAL-RESP. MAGNETO-THERMAL-ANALYSIS. A DETAILED DESCRIPTION OF THE TWO APPARATUS AND OF FURTHER MEASUREMENTS ON RE-Mn-ALLOYS,
by F. Lihl. 31 Oct 64, 74p
Scientific rept. no. SR-10
Contract AF61 052 609

Unclassified report

Descriptors: (*Rare earth elements, Alloys), (*Manganese alloys, Rare earth elements), (*Laboratory equipment, Thermal properties), Quantitative analysis, Laboratory furnaces, Magnetic properties, Intermetallic compounds, Transition temperature, Magnetic materials, Test equipment, Theory, Pyrolysis, Gadolinium, Austria.

An apparatus for measurements on small samples (0,5 - 1 g) of high reactive RE-alloys (RE-Hg, RE-Mn alloys etc.) was developed. It consists of a platinum-wire furnace, a sample holder with crucibles (made of tantalum), an electronic temperature regulation and a recorder. The possibilities of this device are discussed. A magnetic balance is described, which allows measurements on RE-alloys from 80K to 1400K. Measurements on GdMn2, GdMn5 and GdMn12 between 80K and 1370K showed that GdMn2 becomes antiferromagnetic at 86K and that GdMn5 is not ferromagnetic but ferrimagnetic (T sub C = 465K). The results are discussed in terms of the theory of Neel. The number of Bohr-magnetons, gained from the measurements at high temperatures (in the paramagnetic region) are compared with theory.

AD-614 466 Div. 17, 4, 25
CFSTI Prices: HC$2.00 MF$0.50

Technische Hochschule, Vienna (Austria).
X-RAY-, DTA- AND THERMO-MAGNETICAL ANALYSIS OF Y, Sm, Gd, Dy, Ho, Er-Mn-COMPOUNDS,
by F. Lihl. 31 Jan 65, 48p
Scientific rept. no. SR-11
Contract AF61 052 609

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Rare earth elements, Intermetallic compounds), (*Intermetallic compounds, Rare earth elements), (*Manganese alloys, Intermetallic compounds), Chemical analysis, Rare earth compounds, Alloys, Phase studies, X-ray diffraction analysis, X-rays, Fluorescence, Magnetic properties, Paramagnetic resonance, Ferromagnetism, Crystal structure, Crystal lattices, Gadolinium alloys, Gadolinium, Samarium, Dysprosium, Holmium, Erbium, Yttrium, Austria.

A summary of the phases is presented which occur in the systems Gd, Sm, Dy, Ho, Er-Mn. In all these systems the phases REMn2, REMn4 (RE6Mn23 or REMn5) and REMn12 exist (the compound SmMn12 has, up to now, not been detected). The phases HoMn2 and ErMn2 possess (at least at room temperature) the same structure (MgCu2) as the other REMn2 compounds. The lattice spacings of the compounds diminish continously with atomic number. By DTA the systems Gd-Mn and Dy-Mn have been studied and phase diagrams constructed. The X-ray investigations and X-ray fluorescence analysis agree with these diagrams. Magnetic measurements with Y, Sm, Dy, Ho and Er-Mnx (x = 3, 83 - 5) yielded accurate Curie-points. The saturation magnetization of YMn5 and SmMn5 is higher than the values of literature. By measurements of the paramagnetic properties of SmMn5 and HoMn5 above the Curie temperature the fact that these compounds are ferrimagnetic and not ferromagnetic could be established. The results are discussed in terms of the theory of ferrimagnetic substances.

AD-614 501 Div. 17, 26

Laval Univ. (Quebec).
RECRYSTALLIZATION KINETICS OF MARTENSITIC EXTRA-LOW CARBON STEELS,
by A. Galibois and A. Dube. 1964, 23p
Grant DBR7510 26

Unclassified report

Pub. in Canadian Metallurgical Quarterly v3 n4 p321-43 Oct-Dec 1964 (Copies available only to DDC users).

Descriptors: (*Steel, Heat treatment), (*Recrystallization,

Steel), Canada, Dynamics, Carbon alloys, Martensite, Transformations, Temperature, Impurities, Crystal growth, Heat of activation, Microstructure, Hardness, Grain structures (Metallurgy).

An experimental study has been made of the mechanism of tempering of extra-low carbon martensitic steels. This mechanism presents several interesting features but perhaps the most important is the recrystallization that starts at about 550C and constitutes the final stage of softening. This paper presents isothermal recrystallization curves for 0.03 and 0.021 per cent C steels at various tempering temperatures following the martensitic transformation. The effects of purity and temperature on the rates of growth and recrystallization have been studied and the energies of activation for these processes are given. (Author)

AD-614 506 Div. 17, 25

National Research Council of Canada, Ottawa (Ontario)
Div. of Applied Chemistry.
PHYSICAL PROPERTIES OF ALPHA AND GAMMA ARSENIC,
by J. B. Taylor, S. L. Bennett, and R. D. Heyding.
27 Jul 64, 7p Rept. no. NRC-8227
Unclassified report

Pub. in Journal of Physics and Chemistry of Solids v26 p69-74 1965 (Copies available only to DDC users).

Descriptors: (*Arsenic, Physical properties), Crystal lattices, Resistance (Electrical), Magnetic properties, Single crystals, Anisotropy, Temperature, Transformations, Crystallography, Canada.

The unit cell dimensions and the electrical and magnetic properties of crystalline (a) arsenic have been measured as a function of temperature. The resistivities at 293K parallel and perpendicular to the major (trigonal) crystallographic axis and the temperature coefficients are given. The magnetic susceptibilities of a single crystal specimen at 292K were measured. The signs and magnitudes of these values were confirmed by the determination of the magnetic anisotropy of three single crystals in a homogeneous field. The susceptibilities of several polycrystalline specimens are recorded and discussed. The hexagonal unit cell dimensions at 295.6K are: a = 3.7598±0.0003 A; c = 10.547 ±0.002 A. Between 295 and 673K there is little or no change in the unit cell parallel to the basal plane. The coefficient of expansion along the c axis is 47.000002/deg. No evidence was found for a second order transformation in alpha As at ca. 500K as suggested by Klemm. Amorphous alpha arsenic is diamagnetic, the susceptibility at 298K being -22.6 ± .000003 emu/g atom. The susceptibility is only slightly temperature dependent from 80 to 450K. (Author)

AD-614 519 Div. 17

National Research Council of Canada, Ottawa (Ontario).
Div. of Pure Physics.
CONSTITUTION AND MAGNETIC AND ELECTRICAL PROPERTIES OF PALLADIUM TELLURIDES (PdTe-PdTe2),
by A. Kjekshus and W. B. Pearson. 23 Nov 64, 13p
NRC-8269
Unclassified report

Pub. in Canadian Journal of Physics v43 p438-49 Mar 1965 (Copies available only to DDC users).

Descriptors: (*Palladium alloys, Tellurium alloys), (*Tellurium alloys, Palladium alloys), Phase studies, Grain structures (Metallurgy), Metallography, X-ray photography, Magnetic properties, Electrical properties, Superconductivity, Thermoelectricity, Grain boundaries, Intermetallic compounds, Solid solutions, Transition temperature.

The region from PdTe to PdTe2 has been examined by X-ray methods to establish the phase boundaries. The results confirm the existence of a continuous solid solution at high temperatures and narrow homogeneity regions for PdTe and PdTe2 at low temperatures. PdTe is a non-stoichiometric phase, at least below 500C. Magnetic susceptibility, electrical resistivity, thermoelectric power, and superconducting transition temperatures of PdTe and PdTe2 have been measured. (Author)

AD-614 556 Div. 17, 4

McMaster Univ., Hamilton (Ontario). Dept. of Metallurgy and Metallurgical Engineering.
THE PARABOLIC OXIDATION KINETICS OF BETA-ZIRCONIUM.
Revised ed.,
by C. J. Rosa and W. W. Smeltzer. 13 Jul 64, 7p
Unclassified report

Pub. in Acta Metallurgica v13 p55-60 Feb 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 1 Jun 64.

Descriptors: (*Zirconium, Oxidation), (*Oxidation, Zirconium), Phase studies, Oxides, Solid solutions, Diffusion, Integral equations, Canada, Reaction kinetics.

An investigation is reported on the oxidation properties of beta-zirconium at 950C in oxygen for periods extending to 100 hr. The kinetics were determined by a volumetric technique and may be represented by a parabolic relationship after a period of rapid oxidation. The thicknesses of the zirconium dioxide scale and the underlying layer of alpha-zirconium-oxygen solid solution were determined by metallographic techniques. Parabolic diffusion relationships derived from a three phase oxide-metal model account for the kinetics of oxidation, scale growth and oxygen solution in the metal. (Author)

18. Military Sciences and Operations

AD-614 057 Div. 18, 26
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
THE DESIGNER'S IMPACT ON LOGISTICS,
by H. S. Dordick. Apr 65, 13p Rept. no. P-3100
Unclassified report

Prepared for the Logistics Research Conference Panel, Warrenton, Va. 26-28 May 1965.

Descriptors: (*Logistics, Design), (*Management engineering, Logistics), Decision making, Reliability, Maintainability, Systems engineering, Redundant components, Maintenance, Packaging, Performance (Engineering).

Conclusions: An effective government/industry partnership requires the clear definition of logistics requirements by the customer, so that the designer can realistically meet them. These requirements must be consistent with feasibility. They must be reasonable and must not call for breakthroughs when the contract is not meant for such breakthroughs. If the nature of the contract is in essence an applications engineering contract--that is, building to a requirement from off-the-shelf items--then the performance objective must reflect this. The logistics and manufacturing requirements must reflect this also. The logistics manager's responsibility should lead to his direct contact with equipment designers and not just with system engineers whose task it is to define system concepts.

AD-614 239 Div. 18, 12, 24
CFSTI Prices: HC$2.00 MF$0.50

Univac Div., Sperry Rand Corp., St. Paul, Minn.
DEVELOPMENT OF AN ELECTRONIC DATA PROCESSING MODULE FOR MOBILE WING RECONNAISSANCE TECHNICAL SQUADRON.
Final rept. for Jun 63-Oct 64,
by C. A. Christensen. Mar 65, 47p
Rept. no. PX-3287
Contract AF30 602 3171, Proj. 6506
RADC TR-64-520
Unclassified report

Descriptors: (*Data processing systems, Photographic intelligence), (*Photographic intelligence, Data processing systems), (*Digital computers, Photointerpretation), Photographic reconnaissance, Air Force operations, Photographic analysis, Input-output devices, Mobile, Portable.

The Electronic Data Processing Module (EDPM) has been developed to provide computer assistance for the analysis and interpretation of reconnaissance data in the tactical field environment. The EDPM can rapidly process large volumes of data which could not be handled with sufficient speed and accuracy by human operators. The EDPM forms a major functional module of the Mobile wing Recce Tech (MWRT) which is a field deployable reconnaissance reduction facility. The MWRT, in turn, is a major subsystem of the Limited Warfare Intelligence Reduction Complex being developed by the Rome Air Development Center. (Author)

AD-614 386 Div. 18, 28
CFSTI Prices: HC$6.00 MF$1.25

Pittsburgh Univ., Pa. Dept. of Sociology.
THREAT PERCEPTION AND CIVIL DEFENSE,
by Donna K. Kontos. Mar 65, 202p
Contract OCD PS64 61; Grant NSF G11309, Task 48 21C
Unclassified report

Descriptors: (*Civil defense systems, Threat evaluation), (*Threat evaluation, Public opinion), (*Public opinion, Civil defense systems), Shelters, Fear, Attitudes, Civilian personnel, Effectiveness, Targets, Population, Nuclear warfare.

The analysis of the nation's perception of threat included anxiety about war; the nature of the threat perceived, namely: what are the perceived targets and what weapons will be used; estimates of weapons effects; the consequences of threat perception of varying degrees and type for action; and the consequences of threat perception of varying degrees and type on the respondent's feeling about civil defense and/or fallout shelters.

AD-614 423 Div. 18, 8
CFSTI Prices: HC$1.00 MF$0.50

Electronic Systems Div., Air Force Systems Command, Bedford, Mass.
THE ELECTRONIC SYSTEMS DIVISION.
RELIABILITY/MAINTAINABILITY PROGRAM ELEMENTS,
by George H. Allen and Jerome E. Horowitz.
Mar 65, 24p Rept. no. ESD TR-65-193
Unclassified report

Presented as a paper at the Annual West Coast Reliability Symposium (6th) Feb 20, 1965.

Descriptors: (*Reliability (Electronics), Military requirements), (*Command and control systems, Reliability (Electronics)), Electronic equipment, Maintainability, Maintenance, Control systems, Production control.

The Electronic Systems Division (ESD) has been stressing the importance of Reliability and Maintainability (R/M) in the development and acquisition of ground electronic systems/equipments. This report discusses elements of ESD R/M programs. The development of qualitative and quantitative requirements are indicated. Methods and criteria involved in the evaluation of proposals and selection of contractors are presented. Finally, contractor monitoring actions performed by ESD activities and types of problems observed are discussed. (Author)

AD-614 474 Div. 18, 32
CFSTI Prices: HC$2.00 MF$0.50

Department of Justice, Washington, D. C.
REPORT OF THE ATTORNEY GENERAL, PURSUANT TO SECTION 10(c) OF THE SMALL BUSINESS ACT OF 1958 AS AMENDED,
by Nicholas Deb. Katzenbach. 1965, 36p
Unclassified report

Descriptors: (*Armed forces procurement, Law), (*Government procurement, Law), (*Commerce, Law), Procurement.

This report sets forth the result of a survey on the use of administrative debarments of contractors by Government agencies under the Federal Procurement Regulations. It first reviews the provisions in the Regulations relative to maintenance of debarred bidders' lists. The report then sets forth the survey of the use of such lists to debar contractors, particularly on the ground of conviction under the federal antitrust statutes arising out of the submission of bids or proposals. It contrasts this with a check of the actual number of such convictions in cases brought by the Department of Justice over the past ten years. Next the report suggests the potential scope of the problem to which this provision serves as a deterrent and its possible effects on small business competition in procurement. Finally, there are presented certain recommendations for future use by Government agencies of this deterrent provision. (Author)

19. Navigation

AD-613 941 Div. 19
CFSTI Prices: HC$4.00 MF$0.75

Systems Engineering Group, Research and Technology Div., Wright-Patterson AFB, Ohio.
INTEGRATION AND EVALUATION OF THE PHASE I NAVIGATIONAL CAPABILITY FOR PROGRAM 665A, UTILIZING THE AN/ASN-24V(MOD) DIGITAL COMPUTER,
Rept. for Jun 63-Sep 64,
by Emile H. Rieu. 12 Jan 65, 102p SEG-TR-65-1
Unclassified report

Descriptors: (*Aircraft, Celestial navigation), (*Celestial navigation, Aircraft), (*Navigation computers, Operation), Star trackers, Digital computers, Theory.

The navigational accuracies required for the navigation portion of Phase I of Program 665A made it necessary to make several changes to the basic aircraft's (JKC-135A) navigational capability. The changes included the addition of a star-tracking capability, updating existing navigational subsystems, and the installation of a high-speed digital computer, the AN/ASN-24V(MOD). The upgrading resulted in the maximum accuracy that could be achieved within the time and dollar limitations existing at the start of Program 665A. Flight test results have indicated an upgrading of overall navigational accuracy from the 2.0 to 3.0 percent range expected from a standard JKC-135A navigational system. To date, the accuracy measured is ±0.64 percent (percentage ratio of distance from desired flight path to length of flight leg, measured at end of leg) utilizing standard navigational procedures without position fixing. (Author)

AD-614 162 Div. 19, 12

Johns Hopkins Univ., Baltimore, Md.
THE TRANSIT SYSTEM,
by R. B. Kershner and R. R. Newton. 1960, 17p
Unclassified report

Pub. in Journal of the Institute of Navigation v15 n2 p129-44 Apr 1962 (Copies available only to DDC users)
Papers presented at a meeting of the Institute (held jointly with the Electronic Engineering Association) at the Royal Geographical Society on 26 September 1961.

Descriptors: (*Navigation satellites, Systems engineering), (*Doppler navigation, Doppler systems), Orbital trajectories, Ground support equipment, Radio navigation, Radio equipment, Telemeter systems.

The history, use, and accuracy of the Transit navigational satellite are described.

AD-614 238 Div. 19
CFSTI Prices: HC$4.00 MF$0.75

Federal Scientific Corp., New York.
EXPERIMENTAL VERIFICATION OF STAR IDENTIFICATION BY OPTICAL RADIATION ANALYSIS.
Rept. for Jul 63-Jul 64.
Feb 65, 110p
Contract AF33 657 11467, Proj. 4200, Task 420006
AL TDR-64-251
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Star trackers, Optical instruments), (*Stars, Optical analysis), (*Optical instruments, Star trackers), (*Celestial navigation, Star trackers), Systems engineering, Space navigation.

The purpose of this investigation is to experimentally verify prior theoretical conclusions that it is feasible for stars to be recognized from their radiation for use in the guidance and navigation of space vehicles. The experiments were performed at a terrestrial location with equipment capable of high precision measurements. The results indicate that within the atmosphere measurement accuracies are limited primarily by the atmosphere, but are still adequate for reliable stellar recognition. The precision of the measurements achieved are a factor of two better than for data generally published. (Author)

AD-614 443 Div. 19, 5, 8

Systems Research and Development Service, Federal Aviation Agency, Washington, D. C.
COMPARISON OF TWO VHF COMMUNICATION FREQUENCY ASSIGNMENT METHODS,
by John B. Pyle and Paul T. Astholz. Mar 65, 29p
Rept. no. RD-65-21
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Air traffic control systems, Very high frequency), (*Very high frequency, Air traffic control systems), Geography, Navigation charts, Digital computers, Radio interference.

Comparison of present Geographical Multi-Chart and proposed Matrix Methods was conducted using a sample problem area. In manual operation, the proposed method offered no major advantages over the present method. However, the Matrix Method is promising when used in conjunction with a digital computer if the use of a computer can be justified from a cost/benefit viewpoint. (Author)

20. Nuclear Physics and Nuclear Chemistry

AD-613 929 Div. 20
CFSTI Prices: HC$1.00 MF$0.50

Queen's Univ., Belfast (Northern Ireland). Dept. of Applied Mathematics.
DIFFERENTIAL CROSS SECTIONS FOR ELECTRONS ELASTICALLY SCATTERED BY HELIUM ATOMS,
by S. P. Khare. 1965, 12p
Contract N62558 4297
Unclassified report

Descriptors: (*Electrons, Elastic scattering), (*Elastic scattering, Differential cross section), Helium, Polarization.

The differential cross sections for the elastic scattering of electrons by helium atoms at a few selected electron impact energies, in the 10-50 eV energy range, are calculated by using the adiabatic-exchange phase shifts of Labhan and Callaway (1964) for the l = 0, 1 and 2 partial waves, and the static-dipole phase shifts for the higher partial waves. The calculated values are in satisfactory accord with the experimental data of Bullard and Massey (1931) and of Hughes, McMillen and Webb (1932) and with the theoretical values of Khare and Moiseiwitsch (1965), who included exchange only indirectly. The effect of quadrupole polarizability potential on the differential cross sections is also examined and is found to be small. (Author)

AD-613 934 Div. 20, 15
CFSTI Prices: HC$1.00 MF$0.50

Syracuse Univ., N. Y.
NATURE OF THE RESONANCE IN THE STATIC PION-NUCLEON SCATTERING IN ONE-MESON APPROXIMATION,
by A. O. Barut and K. H. Ruei. 1961, 12p
Contract AF49 638 801
AFOSR 880
Unclassified report

Descriptors: (*Meson scattering, Nucleons), (*Resonance scattering, Mesons), (*Integral equations, Meson scattering), Pions, Perturbation theory.

The solution of the Chew-Low integral equation for the static p-wave meson-nucleon scattering is studied as a function of the coupling constant to deduce the nature of the 33-resonance. It is shown that a dynamical resonance must occur in association with either a bound state or with at least one more p-wave resonance. The possibility of a kinematical resonance is also discussed and the effective range formula is derived directly from the dispersion relation. (Author)

AD-613 943 Div. 20
CFSTI Prices: HC$1.00 MF$0.50

Naval Research Lab., Washington, D. C.
DETERMINATION OF RADON CONCENTRATION IN THE AIR THROUGH MEASUREMENT OF ITS SOLID DECAY PRODUCTS.
Interim rept.,
by L. B. Lockhar, Jr., R. L. Patterson, Jr., and C. R. Hosler. 29 Mar 65, 32p Rept. no. NRL-6229
Contract AT49 7 2435, Proj. RR004 02 42 5151
Unclassified report

Descriptors: (*Radioactivity, Atmosphere), (*Radon, Air pollution), (*Radiation measurement systems, Radon), Radioactive decay, Filters (Fluid).

An analytical method was devised for the determination of the radon concentration in the air by measurement of the radioactive decay of the solid radon daughters collected on air filters during a fixed sampling period. The ratio of the radioactivity present at two periods, determined by an initial count immediately after termination of sampling and a second count an hour later, is used to estimate the extent of radioactive equilibrium established between radon and its daughters and to obtain a correction factor for relating radon daughter activity to radon activity. The disintegration rates of the various decay products of radon as a function of the age of the radon conglomerate have been calculated during the growth and collection periods and for successive 5-minute decay periods extending through the first 71 minutes following termination of filtration. A procedure for the calibration of Bata counters for the evaluation of RaB and RaC activities was established. Use was made of this analytical method to determine radon concentrations in the air near ground level. (Author)

AD-613 993 Div. 20, 12, 16
CFSTI Prices: HC$1.00 MF$0.50

Naval School of Aviation Medicine, Pensacola, Fla.
A NOTE ON THE INFLUENCE OF SHIELD GEOMETRY ON AIR DOSE AND TISSUE DOSE FROM PROTONS WITHIN A SPACE VEHICLE,
by Hermann J. Schaefer. 25 Apr 63, 18p
Research rept. no. MR005.13-1002, R-25
N63 19990
Unclassified report

Descriptors: (*Radiation hazards, Space flight), (*Astronauts, Radiation hazards), (*Shielding, Spacecraft), Protons, Dosimeters, Radiation monitors, Heat shields, Radiological dosage, Cosmic rays, Van Allen radiation belt, Geometric forms, Spheres, Conical bodies, Thickness, Tissues (Biology).

For three typical space radiation proton spectra assuming 4 pi incidence the effect of shield geometry on the distribution of air dose within a spherical shell of uniform wall thickness and within a conical vehicle with a heavy heat shield at the base is analyzed theoretically. Highly structured dose patterns are obtained even for the completely symmetrical spherical vessel. Comparative analysis of the depth dose distribution in a tissue phantom of 30 cm diameter at two different locations in the conical vehicle shows that greatly different tissue doses can prevail at locations which show equal air doses. It is concluded that the tissue dose in the body of the astronaut cannot be accurately inferred from stationary radiation sensors, but requires instruments carried on the body. (Author)

AD-614 023 Div. 20, 25
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
'EARTHLY SUN' OBEY,
26 Mar 65, 5p FTD-TT-64-1326
TT 65-61995
Unclassified report

Unedited rough draft trans. from Izvestiya (USSR) n271 p 5 Nov 13 1964.

Descriptors: (*Nuclear physics, Power supplies), (*Magnetohydrodynamics, Energy conversion), Lasers, Plasma physics, Nuclear reactions, Control, USSR.

A popularized Russian newspaper article on the progress of controlled nuclear reactions as a power source is presented.

AD-614 037 Div. 20
CFSTI Prices: HC$2.00 MF$0.50

General Dynamics/Fort Worth, Tex.
REACTOR INSTRUMENTATION RESPONSE TO IN-CORE VOID FORMATION.
Technical rept. for 1 Oct 63-30 Sep 64,
by E. L. Jordan. Mar 65, 35p FZK-215
Contract AF29 601 6213, Proj. 6773, Task 677305
WL TR-64-145

Unclassified report

Descriptors: (*Boiling water reactors, Instrumentation), (*Bubbles, Steam), (*Reactor hazards, Boiling water reactors), (*Reactor cores, Boiling), Nucleate boiling, Film boiling, Test reactors, Reactor coolants, Simulation, Air, Band-pass filters, Test reactors.

The response of reactor instrumentation to in-core void formations that simulate nucleate and partial-film boiling was studied in the Reactivity Test Assembly. The voids were generated by bubbling air through the desired element position. The experiments were performed with core configurations representing the Ground Test Reactor and the Aerospace Systems Test Reactor. The void coefficient of reactivity and the instrumentation response were measured for void fractions of up to 0.15 delta V/V. Simulated boiling was not detected by observation of the normal reactor instrumentation, but amplification and bandpass filtering permitted detection for single-element void volumes greater than 0.05 delta V/V. (Author)

AD-614 087 Div. 20

Yale Univ., New Haven, Conn.
SCATTERING OF PIONS BY LIGHT NUCLEI,
by Morton M. Sternheim. 6 Apr 64, 11p
Grant AF AFOSR 394-63
AFOSR 65-0508

Unclassified report

Pub. in The Physical Review v135 n4B pB912-20 Aug 24 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Pions, Nuclear scattering), (*Nuclear scattering, Pions), Lithium, Carbon, Oxygen, Nuclei, Elastic scattering, Nuclear models, Nuclear cross sections, Mass-energy relation, Electrons, Nuclear energy levels.

The scattering of pions by light nuclei is calculated using an approximate, high-energy, small-angle multiple-scattering expansion which neglects off-the-energy shell scattering. The approximations needed to obtain this expansion from an exact multiple-scattering theory are examined. It is found that the unknown contribution of the off-the-energy-shell scattering makes any calculation of pion-nucleus scattering unreliable for large angles. Using pion-nucleon phase shifts and electron-scattering data, results are obtained for the scattering of pions of about 80 mev by lithium, carbon, and oxgen.

AD-614 089 Div. 20

Yale Univ., New Haven, Conn.
ANALYSIS OF NUCLEON TRANSFER DATA,
by G. Breit, J. A. Polak, and D. Torchia. 1964,
Contract AF30 1 1807; Grant DA ARO D31 124G607,
PROJ. 200 050B700
AROD 893:100; NYO 1807-8

Unclassified report

Pub. in mono. Comptes Rendus du Congres International de Physique Nucleaire, Volume II, Communications, Paris, 1964, p1093-4 (Copies available only to DDC users).

Descriptors: (*Nucleons, Nuclear reactions), (*Nuclear reactions, Nucleons), Nitrogen, Isotopes.

Angular distribution data on the reaction 14N(14N,13N) 16N were fitted using energy-independent real and energy-dependent imaginary spin-independent potential tails in the previously developed M/mu = 0 approximation. The same type of potential gave an approximate fit to 14N elastic scattering by 14N at laboratory energy E = 21.7 Mev. The calculated total cross section varies more rapidly than the observed cross section by a factor of about 10 from E = 12.3 to 18.0 Mev, indicating the presence of a specific effect such as virtual Coulomb excitation enhancing low E transfer. Omission of acceleration effects, spin dependence, difference in 14N-14N and 13N-15N interactions, and transfer anisotropy may contribute to the discrepancy.

AD-614 143 Div. 20, 15

Purdue Univ., Lafayette, Ind.
CONSIDERATIONS ON THE ISOBAR MECHANISM AND RESONANCE POLES FOR PION-BARYON SYSTEMS,
by I. P. Gyuk and S. F. Tuan. 13 Jan 64, 9p
Grant AF AFOSR276 64
AFOSR 65-0494

Unclassified report

Pub. in Nuovo Cimento (Italy) v32 (ser. 10) p227-33 Apr 1 1964 (Copies available only to DDC users).

Descriptors: (*Resonance scattering, Pions), (*Pions, Baryons), (*Nuclear isobars, Resonance scattering), Nuclear spins, Nucleons, Parity, Complex variables, S-matrix.

AD-614 144 Div. 20

Purdue Univ., Lafayette, Ind.
POSSIBLE EXPERIMENTAL CONSEQUENCES OF TRIANGLE SINGULARITIES IN STRANGE-PARTICLE PRODUCTION PROCESSES,
by Y. F. Chang and S. F. Tuan. 30 Jun 64, 9p
Grant AF AFOSR274 64
AFOSR 65-0495

Unclassified report

Pub. in Physical Review (U. S.) v136 n3B pB741-8 Nov 9 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Strange particles, Nuclear reactions), Nuclear resonance, Baryons, K mesons, Pions, Protons, Mass spectrum, Decay schemes, Selection rules, Nuclear energy levels, Perturbation theory.

Observable consequences of anomalous threshold singularity for triangle diagrams are examined with special reference to cases where baryon resonances of narrow width participate as an internal line in the E channel. It is found that the reaction K(-) + p to K + pion + Xi with, with Xi* (1530) included as an internal line of the graph, offers the best experimental situation for detecting an anomalous singularity effect by studying the (K-pion) mass spectrum in final state. (Author)

AD-614 145 Div. 20, 25

Minnesota Univ., Minneapolis. School of Physics.
EXPERIMENTS ON DYNAMIC POLARIZATION OF PROTONS IN POLYETHYLENE BY THE 'SOLID EFFECT'. A PROPOSED POLARIZED PROTON TARGET,
by C. F. Hwang and T. M. Sanders, Jr. 1959, 14p
Contracts AF49 638 811, AT11 1 50
AFOSR 119

Unclassified report

Pub. in International Symposium on Polarization. Helvetica Physica Acta, Suppl 6 p122-33 1960
(Copies available only to DDC users).

Descriptors: (*Protons, Polarization), (*Particle accelerator targets, Polyetylene plastics), (*Polyethylene plastics, Particle accelerator targets), Radiation damage, Test facilities, Reviews, Nuclear spins, Selection rules, Nuclear magnetic resonance, Spectrum analyzers.

A report is given on the 'state of the art' with regard to the polarization of nuclei, in particular of protons, in environments suitable for use as polarized targets for scattering experiments. Discussed are: (1) design criteria for a polarized proton target; (2) possible methods of polarization; (3) recent experimental work in various laboratories which encourages one to believe that a useful polarized target can be realized; (4) the studies made at the University of Minnesota on this subject.

AD-614 150 Div. 20

Purdue Univ., Lafayette, Ind.
ENERGY PEAKS FOR THREE-BODY MESON SYSTEMS,
by S. F. Tuan. 2 Jul 64, 4p
Grant AF AFOSR-274-64
AFOSR 65-0496

Unclassified report

Pub. in Physics Letters v11 n3 p248-50 Aug 1 1964
(Copies available only to DDC users).

Descriptors: (*Meson reactions, N-body problem), (*Nuclear spectroscopy, Meson reactions), Pions, K-mesons, Nuclear resonance.

In direct meson-unstable meson systems energy peaks are found for which there are no definite spin nor isospin quantum numbers and are thus not resonances in the conventional sense. It is questioned whether such peaks will generate resonances in coupled channels when the crossed one meson exchange diagram is joined by unitarity to final (and/or initial) system involving stable mesons only. The unitarity problem is discussed and it is shown that in general no resonance is expected in the coupled channels.

AD-614 151 Div. 20, 15

Purdue Univ., Lafayette, Ind.
MESON EFFECTS IN n-p CAPTURE,
by G. Stranahan. 6 May 64, 8p
Grant AF AFOSR274 64
AFOSR 65-0497

Unclassified report

Pub. in The Physical Review v135 n4B pB953-60 Aug 24 1964.
(Copies not available to DDC or Clearinghouse customers).
Revision of manuscript submitted 6 Nov 63.

Descriptors: (*Meson reactions, Neutron capture), (*Neutron capture, Proton capture), (*Proton capture, Neutron capture), Nucleons, Deuterons, Nuclear isobars, Nuclear forces, Nuclear models, Operators (Mathematics).

A contribution to the n-p capture amplitude which results from the modification of the nucleon current operators by the nuclear interaction is calculated. The two-nucleon states are represented by Heitler-London states and the capture amplitude is related to single-nucleon matrix elements by means of an expansion corresponding to the exchange of mesons between the nucleons. These single-nucleon matrix elements are evaluated using the fixed-source theory. The one-meson excited Heitler-London state gives a contribution similar to the isobar model of Austern; the role of this state in the nuclear potential is also discussed. If a deuteron wave function with a relatively large D-state probability is used, the interaction effect is about 3% of the phenomenological cross section. (Author)

AD-614 152 Div. 20, 15

Purdue Univ., Lafayette, Ind.
MESON-BARYON SYSTEMS AND THEIR RESONANCES,
by I. P. Gyuk and S. F. Tuan. 5 Feb 64, 4p
Grant AF AFOSR274 64
AFOSR 65-0498

Unclassified report

Pub. in The Physical Review v134 n6B pB1320-3 Jun 22 1964.
(Copies not available to DDC or Clearinghouse customers.)
Revision of manuscript submitted 16 Dec 63.

Descriptors: (*Mesons, Baryons), (*Baryons, Mesons), (*Nuclear resonance, Baryons), Pions, Sigma hyperons, Decay schemes, Parity, Quantum mechanics, Matrix algebra.

Meson-baryon systems of angular momentum L are analyzed by considering the relevant crossing matrices. The resultant 'bootstrap' calculations yield the correct quantum numbers for the observed array of particles and resonances. Specifically it is found that Y(1)* (1385) decays into (pion-lambda hyperon) but not (pion-sigma hyperon). Furthermore, a Y(1)* resonance in (5/2-) is predicted which may accommodate the recently discovered Y(1)* (1765). (Author)

AD-614 153 Div. 20, 15

Purdue Univ., Lafayette, Ind.
CROSSING RELATIONS AND LEGENDRE EXPANSIONS IN PION-PION SCATTERING,
by Takeshi Kanki and Arnold Tubis. 18 Jun 64, 12p
Grant AF AFOSR 274 64, Proj. 9751 02
AFOSR 65-0499

Unclassified report

Pub. in The Physical Review v136 n3B pB723-32 Nov 9 1964
(Copies not available to DDC or Clearinghouse customers.)

Descriptors: (*Meson scattering, Pions), (*Series, Meson scattering), Nuclear resonance, Nuclear spins.

The direct use of crossing relations for pion-pion scattering amplitudes, outside the triangle bordered by the lines $s = 0$, $t = 0$, and $u = 0$ in the Mandelstam diagram, is not generally possible. This is because the regions of convergence of the usual Legendre expansions for the amplitudes are restricted by cross-channel cuts in

appropriate costheta variables. These convergence difficulties may be relieved by suitably decomposing each amplitude into two terms. One term differs in analytic properties from the actual amplitude in that portions of the cross-channel cuts in costheta nearest costheta = ±1 are absent. The Legendre expansion of this term has a larger region of convergence than that for the actual amplitude. The other term in the decomposition is expressed in terms of the Legendre series for physical scattering in the cross channels. The amplitudes so represented may now be continued from one physical region to another, and crossing relations may, in general, be directly applied outside the triangle. As a simple application of the formalism, the existence and approximate mass and width of the rho meson are found to be simple consequences of analyticity, unitarity, and crossing symmetry. (Author)

AD-614 154 Div. 20, 15

Purdue Univ., Lafayette, Ind.
UNITARY SYMMETRY AND WEAK INTERACTIONS. II. SU(3) TRANSFORMATION PROPERTIES,
by S. P. Rosen. 6 Apr 64, 4p
Grant AF AFOSR274 64
AFOSR 65-0609

Unclassified report

Pub. in The Physical Review v135 n4B pB1041-4 24 Aug 1964.
(Copies not available to DDC or Clearinghouse customers). See also AD-613 814.

Descriptors: (*Leptons, Decay schemes), (*Transformations (Mathematics), Hamiltonian), Operators (Mathematics), Nuclear spins, Selection rules, Nuclear reactions.

It is shown that if weak interactions are T-L invariant and satisfy the increment of T = 1/2 rule, their SU(3) transformation properties are severely limited. The nonleptonic Hamiltonian must belong to an octet, and the leptonic Hamiltonian is restricted to an octet and decuplet. To prove this result, the matrix elements of certain spin-type operators are expressed in terms of the Casimir operators for SU(3). T-L invariance and the increment of T = 1/2 rule impose constraints upon the eigenvalues of these Casimir operators and hence limit weak interactions in the manner described above. The converse of this result is not true: for example, a Hamiltonian belonging to an octet is not necessarily T-L invariant. (Author)

AD-614 167 Div. 20

California Univ., Berkeley.
PHASE-SHIFT EQUATIONS FOR MANY-CHANNEL PROBLEMS,
by C. Zemach. 18 Mar 64, 9p
Grant AF AFOSR232 64, Proj. 9751, Task 975101
AFOSR 65-0493

Unclassified report

Pub. in Il Nuovo Cimento v33 s10 p939-47 Aug 10 1964
(Copies available only to DDC users).

Descriptors: (*Differential equations, Phase shift), (*Nuclear particles, Nuclear scattering), Potential theory, Special functions (Mathematical), Momentum.

First-order differential equations for phase shifts are obtained for the many-channel case as a generalization of Calogero's results for ordinary potential scattering (Nuovo Cimento, v. 37:261, 1963). (Author)

AD-614 171 Div. 20, 15

Maryland Univ., College Park.
THE phi-omega MIXING ANGLE,
by Y. S. Kim, S. Oneda, and J. C. Pati. 30 Mar 64, 5p
Grant AF AFOSR500 64
AFOSR 65-0500

Unclassified report

Pub. in Physical Review (U. S.) v135 n4B pB1076-9 Aug 24 1964(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Decay schemes, Mesons), (*Mesons, Decay schemes), Pions, Photons, K mesons, Meson reactions, Nuclear models, Transformations (Mathematics), Perturbation theory.

Under the assumption of vector-meson dominance for the decays pion(0) to 2 gamma, omega to 3 pions and phi to rho + pions, we obtain the phi-omega mixing angle from the observed decay rates for these processes. The mixing angles thus obtained are smaller than the Okubo-Sakurai value derived from the Gell-Mann-Okubo mass formula for the vector-meson octet. The lower mixing angles obtained here correspond to only a small violation (less than 10%) of the mass-square formula. Further possible checks on the mixing angles obtained here, as well as on the hypothesis of phi-omega mixing and the vector-meson dominant model are discussed. (Author)

AD-614 172 Div. 20

Maryland Univ., College Park.
SU(3) SYMMETRY AND THE NONLEPTONIC K-MESON PROCESSES,
by S. Oneda, Y. S. Kim, and D. Korff. 7 Jul 64, 10p
Grant AF AFOSR500 64
AFOSR 65-0501

Unclassified report

Pub. in The Physical Review v136 n4B pB1064-73 Nov 23 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*K mesons, Decay schemes), (*Meson reactions, K mesons), Leptons, Pions, Selection rules, Nuclear models, Transformations (Mathematics), Bremsstrahlung.

Consequences of the SU(3) octet scheme for the nonleptonic weak interactions are studied in some of the nonleptonic K meson processes. The K(1)0-K(2)0 mass difference and the rates of K(2)0 to 2 gamma and K(2)0 to pion (+) + pion pion (-) + gamma decays are discussed. The effect of omega-phi mixing is considered in the K(2)0 to 2 gamma decay. The possible violation of the absolute value of the increment of I = 1/2 rule in the K(2)0 to 2pi decay is discussed in terms of the eta-meson pole contribution. The characteristic features of K(+) to pion (+) + pion (0) + gamma and K(+) to 3 pion decays in our model are also discussed. It is inferred that the rate of K(+) to pion (+) + pion (0) + gamma decay is dominated by the internal bremsstrahlung contribution. A possible effect of a unitary singlet pseudoscalar meson on these problems is also discussed. (Author)

AD-614 174 Div. 20, 25

Maryland Univ., College Park.
REMARKS ON STRANGENESS NON-CONSERVING WEAK LEPTONIC INTERACTIONS,
by Sadao Oneda. 10 Jan 64, 7p
Grant AF AFOSR500 64
AFOSR 65-0504

Unclassified report

Pub. in Nuclear Physics v57 p89-95 1964 (Copies available only to DDC users).

Descriptors: (*Leptons, Nuclear reactions), (*Meson reactions, Mathematical models), K mesons, Pions, Resonance, Vector analysis, Strange particles, Selection rules.

The possibility that both the leptonic currents and the vector K-pi resonance, M, couple with the same strangeness changing currents is discussed. The magnitude of renormalized coupling constant and the form factors of K sub mu 3-decay are discussed. A reasonable consistency with the experimental situations with regard to the leptonic strangeness changing processes and to the K-pi resonances is indicated. (Author)

AD-614 175 Div. 20, 25

Maryland Univ., College Park.
UNITARY SYMMETRY AND NON-LEPTONIC K-DECAYS,
by Y. S. Kim and S. Oneda. 25 Nov 63, 3p
Grant AF AFOSR500 64
AFOSR 65-0505

Unclassified report

Pub. in Physics Letters (U. S.) v8 n1 p83-5 Jan 1 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Meson reactions, Selection rules), (*K mesons, Selection rules), (*Selection rules, Meson reactions), Vector analysis, Hamiltonian, Strange particles, Pions, Operators (Mathematics).

It has been assumed that as the simplest generalization in which the /delta-I/ = 1/2 isospin selection rule is built, the weak non-leptonic interaction Hamiltonian, together with pseudoscalar and the vector mesons, belongs to the SU(3) octet. A discussion is given of some experimental implications of this assumption in various K-decay processes.

AD-614 176 Div. 20

Brookhaven National Lab., Upton, N. Y.
DYNAMICAL MODEL OF THE 1535-MeV Xi* HYPERON,
by Jogesh C. Pati. 28 Oct 63, 10p
Grants NSF GP1193, AF AFOSR500 64
AFOSR 65-0506

Unclassified report

Pub. in Physical Review, v134 n2B pB387-96 Apr 27 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hyperons, Dynamics), (*Nucleons, Hyperons), Antiparticles, K mesons, Nuclear models, Nuclear resonance, Nuclear spins, Nuclear scattering, Pions.

An attempt is made to understand the dynamical origin of the 1535-MeV Xi* hyperon. We study the problem of scattering in the J =3/2(+)-state of the anti-Kaon lambda hyperon-channel by the N/D method. The influence of all other channels are ignored. The dynamical singularities of the partial-wave amplitude are assumed to arise mainly from the near by cut (due to the nucleon exchange in the crossed channel) and the far left-hand cut (-infinity <S< or= 0). The contribution of the former is evaluated explicitly in terms of the lambda hyperon-NK coupling constant and that of the latter, by the method of Balazs, through the introduction of the effective range pole terms. The analysis is found to be quite insensitive to the choice of the lambda hyperon-NK coupling constant. The D function is found to have the desired behavior for the occurrence of a resonance or bound state in the energy region of interest. The main force for the existence of the resonance or bound state seems to arise from the singularities associated with the far left-hand cut. The best set of self-consistent solutions for the position and residue indicates the presence of a bound state in the J =3/2(+) state of anti-Kaon lambda hyperon system at S 109 m(pi) squared with residue K sub Xi* 10. (Author)

AD-614 181 Div. 20, 15

Maryland Univ., College Park.
COUPLING OF INTERNAL AND SPACE-TIME SYMMETRIES,
by O. W. Greenberg. 13 May 64, 4p
Grants NSF GP1193, AF AFOSR500 64
AFOSR 65-0507

Unclassified report

Pub. in Physical Review v135 n6B pB1447-50 Sep 21 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Nuclear structure, Groups (Mathematics)), Baryons, Nuclear models, Operators (Mathematics).

When Lorentz invariance is ignored, internal symmetries which are violated in a given way, and which are independent of the space-time symmetries, can be rewritten in terms of a larger group which contains the internal group and the time-translation group in a coupled (noncommuting) way. This rewriting can be chosen so that the noncommutativity of the time-translation and internal groups splits the mass degeneracy of internal multiplets, i.e., accounts for what was previously called 'violation' of the internal group. This procedure is illustrated explicitly for the SU(3) baryon octet with octet symmetry violation. When Lorentz invariance is required, the coupling of internal and space-time symmetries becomes more difficult. A global and more general proof is given of McGlinn's result that in a larger group g whose generators are those of the Poincare (i.e., inhomogeneous Lorentz) group and an internal group, for certain internal groups the commutativity of the (homogeneous) Lorentz and internal subgroups implies the commutativity of the space-time translation and internal subgroups. In addition, it is shown that in such a group g, which has an internal group for which the commutativity of the Lorentz and internal subgroups does not imply the commutativity of the translation and internal subgroups, the internal multiplets still remain degenerate in mass. (Author)

AD-614 187 Div. 20

Enrico Fermi Inst. for Nuclear Studies, Univ. of Chicago, Ill.
A DETERMINATION OF THE SPIN OF LITHIUM 8 HYPERNUCLEUS,
by D. H. Davis, R. Levi Setti, and M. Raymund.
3 Sep 62, 5p
Contract AF49 638 209, Proj. 9751, Task 9751 01
AFOSR 65-0464

Unclassified report

Pub. in Nuclear Physics v41 p73-7 1963 (Copies available only to DDC users).

Descriptors: (*Lithium, Nuclear spins), (*Decay schemes, Lithium), (*Nuclear spins, Lithium), Nuclear energy levels, Pions, Helium, Nuclei, Momentum, Meson reactions, Programming (Computers).

43 events representing the decay Li8 to pion(-) + He4 + He4 have been collected. Evidence is presented which

shows that this decay proceeds almost exclusively through states of Be8. The predominance of the 2.9 MeV 2+ Be8 level together with the angular distribution of the decay products for events involving this level suggest that the spin of Li8 hypernucleus is one. (Author)

AD-614 204 Div. 20, 2, 15

California Inst. of Tech., Pasadena.
THE EFFECT OF THE 3.10 MeV STATE OF F17 ON THE 016(p, gamma) REACTION,
by John J. Domingo. 16 Jun 64, 17p
Contract Nonr22047

Unclassified report

Pub. in Nuclear Physics (Netherlands) v61 p39-55 1965 (Copies available only to DDC users).

Descriptors: (*Gamma-proton reactions, Oxygen), (*Nuclear energy levels, Fluorine), (*Oxygen, Fluorine), Nuclear models, Differential cross section, Elastic scattering, Integrals, Astrophysics.

The yields of the two capture gamma rays in the O16 (p, gamma) reaction have been measured at 90 deg to the beam for bombarding energies in the range 2.56-2.76 MeV. An anomaly was observed in the yield of the capture gamma ray leading to the 0.500 MeV 1/2(+) state of F17. No anomaly was observed in the yield of the capture gamma ray leading to the 5/2(+) ground state of F17. The experimental results were found to be in good agreement with theoretical calculations made on the basis of the extranuclear capture model of Christy and Duck. On the basis of the experimental results and these calculations, the single-particle reduced widths for the 1/2(+) 0.500 MeV state and the 5/2(+) ground state of F17 were determined. These single-particle reduced widths were found to be 0.57±0.10 and 0.38±0.08, where the definition of Lane was used. From the shape of the anomaly observed in the yield of the capture gamma ray leading to the 1/2(+) state and the extranuclear calculations, an upper limit was placed upon the width of the gamma ray transition leading from the resonant 1/2(-) state at 3.10 MeV to the 1/2(+)0.500 MeV state. This limit was <0.03 eV. (Author)

AD-614 205 Div. 20

California Inst. of Tech., Pasadena.
COULOMB EXCITATION OF Tm169,
by J. De Boer. 23 Jun 64, 7p
Contract Nonr22047

Unclassified report

Pub. in Nuclear Physics v61 p675-81 1965 (Copies available only to DDC users).

Descriptors: (*Thulium, Excitation),(*Excitation, Thulium), Electric fields, Ions, Oxygen, Ground state, Nuclear models, Nuclear energy levels, Nuclear spins.

The Coulomb excitation of Tm169 was studied using oxygen ions of energies up to 44 MeV as bombarding particles. De-excitation gamma rays were recorded in coincidence with back-scattered particles. The cascade/crossover branching ratios in the decay of the rotational levels of the K = 1/2 band are compared with the predictions of the rotation model. It is found that, within experimental errors, a single set of rotational parameters g sub r, g sub k, b sub 0 and Q sub 0 describes all electromagnetic properties of the ground state band. Transitions assigned to gamma vibrational bands with K sub 1= K sub 0 ±2 were also observed. (Author)

AD-614 213 Div. 20

Enrico Fermi Inst. for Nuclear Studies, Univ. of Chicago, Ill.
ABSORPTION OF Sigma(-) HYPERONS IN PHOTOGRAPHIC EMULSION NUCLEI,
by D. H. Davis, B. Anderson, and O. Skjeggestad.
11 Jul 63, 6p
Contract AF49 638 209, Proj. 9751, Task 975101
AFOSR 65-0463

Unclassified report

Pub. in Physical Review (U. S.) v132 n5 p2281-4 Dec 1 1963 (Copies not available to DDC or Clearinghouse customers)
Prepared in cooperation with Oslo Univ. (Norway).

Descriptors: (*Sigma hyperons, Absorption), (*Nuclei, Absorption), (*Photographic emulsion, Nuclei), K mesons, Meson capture, Hyperons, Spallations, Silver, Bromine, Carbon, Nitrogen, Oxygen.

396 sigma(-) capture stars in nuclear emulsion have been analyzed. The new data have been combined with 231 similar events previously reported. The rate of hyperfragment emission from sigma(-) stars is (2.7+0.5-0.4)%. Both this rate and an estimate of the frequency of cryptofragment formation are compared with the analogous quantities pertinent to K(-) absorptions at rest. Evidence is presented that hyperfragments predominantly originate from sigma(-) absorptions in the light elements of the emulsion, while cryptofragments are formed following sigma(-) absorption in heavy nuclei. (Author)

AD-614 221 Div. 20, 15

Atomic Energy of Canada, Ltd., Chalk River (Ontario).
THE RESOLUTION FUNCTION OF A TWO-ROTOR NEUTRON VELOCITY SELECTOR,
by R. J. Royston. 13 Apr 64, 19p A.E.C.L. 2052

Unclassified report

Pub. in Nuclear Instruments and Methods (Netherlands) v30 p184-202 1964 (Copies available only to DDC users).

Descriptors: (*Neutron detectors, Neutron beams), (*Neutron beams, Velocity), (*Velocity, Selection), Rotation, Functions.

Some general considerations of neutron pulses are given and these are applied to yield the idea of an effective chopping point for a two-rotor system. The shape of a pulse from a system of parallel slot rotors is then calculated and the effects of slot multiplicity and rotor jitter are computed. These results are used to compute the resolution function of a two-rotor velocity selector. (Author)

AD-614 250 Div. 20, 15
CFSTI Prices: HC$3.00 MF$0.75

General Dynamics/Fort Worth, Tex. Nuclear Aerospace Research Facility.
FORMULATION OF RADIATION TRANSPORT SOLUTIONS FOR SHIELDING APPLICATIONS, INCLUDING INTEGRAL TRANSFORM METHODS, MATRIX TECHNIQUES, AND ASYMPTOTIC APPROXIMATIONS.
Technical rept. for 1 Oct 63-30 Sep 64,
by J. M. Norwood and R. E. Beissner. Mar 65, 85p
Rept. no. FZK-201
Contract AF29 601 6213, Proj. 6773, Task 677301
WL TR-64-151

Unclassified report

Descriptors: (*Neutron transport theory, Shielding),

(*Shielding, Neutron transport theory), Integral equations, Integral transforms, Matrix algebra, Special functions (Mathematical), Electrons, Charged particles, Transport properties.

The objective of this study is to develop new and improved computational models for the determination of radiation intensity behind bulk shields and to provide further insight into radiation transport phenomena. A study of integral transform methods as applied to the neutron transport equation in finite geometries under the spherical harmonics formulation is presented, representative problems are treated in slab, spherical, and cylindrical geometries. A matrix-integral-operator solution in slab geometry is included. The results of a study of an asymptotic method of obtaining angular distributions behind bulk shields are presented and the problem of electron transport in the 1- to 5-Mev range is discussed. (Author)

AD-614 270 Div. 20
CFSTI Prices: HC$2.00 MF$0.50

High-Energy Physics Lab., Stanford Univ., Calif.
ELECTRON SCATTERING ON NUCLEONS, THREE-BODY NUCLEI, AND Ca40,
by R. Hofstadter. 24 Nov 64, 35p HEPL-355
Unclassified report

Descriptors: (*Electron beams, Nuclear scattering), (*Nuclear scattering, Electron beams), (*N-body problem, Nuclear scattering), (*Calcium, Nuclear scattering), Electrons, Nucleons, Elastic scattering, Relativity theory, Tritium, Nuclear forces, Nuclei.

The experimental results of elastic scattering of electrons are given. The structure of protons and neutrons is studied using the form factor given by relativity theory, and the scattering amplitude of scattered electrons. Two mirror nuclei, Helium-3 and Hydrogen-3, are studied as examples of the three-body problem. The shape of the charge distribution of the nucleus of Ca40 is discussed.

AD-614 276 Div. 20
CFSTI Prices: HC$1.00 MF$0.50

High Energy Physics Lab., Stanford Univ., Calif.
PHOTODISINTEGRATION OF THE DEUTERON BY POLARIZED PHOTONS,
by F. F. Liu. Nov 64, 23p Rept. no. HEPL-356
Unclassified report

Supported in part by ONR, AEC, and AFOSR.

Descriptors: (*Photon bombardment, Deuterons), (*Deuterons, Photon bombardment), Nuclear reactions, Photons, Pions, Polarization, Nucleons, Protons, Differential cross section.

The asymmetry in the photodisintegration of the deuteron by polarized photons has been measured between photon energies of 75 and 230 MeV. Measurements are made mostly at 90 degrees in the center of mass system, but limited data at 45 degrees and 135 degrees are also obtained. The data below 140 MeV are compared with current theories. At 90 degrees our results are generally smaller than theoretical calculations. The measured asymmetry changes sign at about 130 MeV and shows a backward peaking at the high energy points. (Author)

AD-614 366 Div. 20

Cornell Univ., Ithaca, N. Y.
ESR MEASUREMENT OF SPIN SUSCEPTIBILITY OF GRAPHITE IN A LOW MAGNETIC FIELD,
by R. C. Wayne and R. M. Cotts. 8 Apr 63, 2p
Unclassified report

Pub. in Journal of Chemical Physics v39 n5 p1337-8 Sep 1 1963 (Copies not available to DDC or Clearinghouse customers).
Research supported by National Science Foundation and Advanced Research Projects Agency, Washington, D. C.

Descriptors: (*Graphite, Nuclear magnetic resonance), (*Nuclear magnetic resonance, Graphite), (*Aluminum, Nuclear magnetic resonance), Crystals, Magnetic fields, Powders, Probes (Electromagnetic).

The spin susceptibility of pure crystals of natural graphite has been measured by comparing the integrated intensity of the electron spin resonance signal to the intensity of the nuclear magnetic resonance of a known amount of aluminum powder mixed with the graphite sample. Both resonances were observed by using a crossed-coil nuclear induction probe at 12.8 Mc/sec. At 300 degrees K, the spin susceptibility is found to be (1.44±0.3)X10 to the minus 8th power cgs units per gram in agreement with known microwave measurements and theory. The apparent g value of low-field resonances observed with the crossed-coil probe is briefly discussed. (Author)

AD-614 368 Div. 20

Illinois Univ., Urbana. Dept. of Physics.
DETERMINATION OF RECOILLESS FRACTIONS FROM MOSSBAUER SCATTERING,
Revised ed.,
by P. Debrunner and R. J. Morrison.
23 Sep 64, 5p
Unclassified report

Pub. in Review of Scientific Instruments v36 n2 p145-9 Feb 1965 (Copies not available to DDC or Clearinghouse customers)
Supported by U. S. Office of Naval Research
Revision of manuscript submitted 26 Aug 64.

Descriptors: (*Mossbauer effect, Resonance scattering), Energy, Gamma-ray scattering, Gamma rays, Intensity, Statistical mechanics, Statistical functions, Distribution theory, Integrals, Resonance absorption, Thickness.

The intensity of the recoilless and nonrecoilless resonant scattering of Mossbauer gamma rays for single line Lorentzian energy distributions is calculated. The scattered intensities are expressed in terms of a scattering function which contains the parameters of the scatterer. This scattering function has been evaluated for a wide range of values of the recoilless fraction, electronic absorption, thickness, and linewidth of the scatterer. It can be used to determine source and scatterer recoilless fractions from the total scattered intensities. If the recoilless fraction is sufficiently large the recoilless and the nonrecoilless part of the resonantly scattered intensity can be determined, with the aid of numerical calculations given, from a measurement of the transmission of the scattered gamma rays through a resonant absorber. The ratio of the recoilless to the nonrecoilless part of the resonantly scattered intensity does not depend very sensitively upon the properties of the source and can be used to determine unambiguously the recoilless fraction of the scatterer. (Author)

AD-614 374 Div. 20, 15

Johns Hopkins Univ., Baltimore, Md.
SCATTERING MATRIX APPROACH TO THE LAMBDA

HYPERON-PION RESONANCE,
by K. C. Wali, T. Fulton, and G. Feldman.
1 May 61, 2p

Unclassified report

Pub. in Physical Review Letters (U. S.) v6 n11 pP503 1-2-2 Jun 1 1961 (Copies not available to DDC or Clearinghouse customers).
Supported by NSF and AFOSR.

Descriptors: (*S-matrix, Resonance scattering), (*Resonance scattering, Elementary particles), (*Elementary particles, Resonance scattering), Pions, Hyperons, K mesons, Antiparticles, Meson scattering, Parity.

AD-614 375 Div. 20, 15

New York Univ., N. Y.
SCATTERING, WEAK DECAYS, AND FINAL-STATE INTERACTIONS IN MODEL THEORIES IN A DRESSED-PARTICLE PICTURE,
by Kurt Haller. 17 Jul 62, 9p

Unclassified report

Pub. in Journal of Mathematical Physics (U. S.) v4 p323-31 Mar 1963 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Meson scattering, Integral equations), (*Decay schemes, Fermions), Nuclear models, S-matrix, Hamiltonian, Elementary particles, Iterative methods, Mesons.

Elastic and inelastic collisions in the Lee model are treated in a dressed-particle picture. The procedure by which the renormalization constant Z disappears from the integral equations for the transition matrix is studied in detail. A new procedure is given for obtaining the exact transition matrix for N - theta scattering. A hypothetical fermion B is introduced and the decays B to N + theta B to V + theta, as well as the decay in the Goldberger-Treiman model are studied in the dressed-particle picture. The iterative expansion of the B to V + theta decay amplitude is obtained and is shown to agree with the renormalized power series for this decay, though such is not the case for B to N + theta decay, or the decay in the Goldberger-Treiman model. It is shown that in the final-state interaction of B to V + theta decay, there are cancellation effects between one-and two-meson contributions, which are crucial in avoiding divergences. (Author)

AD-614 432 Div. 20
CFSTI Prices: HC$1.00 MF$0.50

Naval Air Development Center, Johnsville, Pa. Aeronautical Electronic and Electrical Lab.
A SOLID STATE NUCLEAR DETECTOR.
Final rept.,
by G. E. Wilcox. 23 Mar 65, 18p
Rept. no. NADC-EL-6504
Tasks R360FR102 2021R011 01 01, FR40 3 05

Unclassified report

Descriptors: (*Radiation measurement systems, Solid state physics), (*Dosimeters, Radiation measurement systems), Photoelectric materials, Electroluminescence, Materials, Phosphorescent materials, Scintillation counters, Alpha particles, Beta particles, Gamma rays, Neutrons, Nuclear particles, Design, Materials.

A study was undertaken to determine the applicability of photoconductive (PC) and electroluminescent (EL) materials to a scintillation system for the detection and measurement of nuclear radiation. Efforts to amplify individual light flashes from scintillation phosphors by using ELPC sandwiches as light amplifiers met with little success because of the slow response time characteristic of the photoconductor. This characteristic, however, made the PC element a valuable integrating device, and a simple, reliable, and economical solid state ratemeter was developed and evaluated for the measurement of alpha, beta, gamma, and neutron dose rates over a wide range of operation. In view of the universal need for a versatile, low-cost radiation dose ratemeter, it is recommended that the results of this effort be made available to potential users. (Author)

AD-614 451 Div. 20
CFSTI Prices: HC$4.00 MF$1.00

General Dynamics/Fort Worth, Tex. Nuclear Aerospace Research Facility.
THE INTERACTIONS OF 14.6-MEV NEUTRONS IN IRON, LITHIUM-7, AND CARBON.
Technical rept. for 1 Oct 63-30 Sep 64,
by G. T. Western, R. C. Baird, F. L. Gibbons, and J. R. Williams. Mar 65, 128p Rept. no. FZK-210
Contract AF29 601 6213, Proj. 6773, Task 677301
WL TR-64-140

Unclassified report

Descriptors: (*Neutron cross sections, Inelastic scattering), (*Inelastic scattering, Neutron scattering), (*Shielding, Neutron scattering), Iron, Lithium, Carbon, Secondary emission, Gamma rays, Gamma-neutron reactions, Differential cross section, Nuclear binding energy, Gamma-ray spectroscopy, Nuclear radiation spectrometers, Time-interval counters.

A time-of-flight spectrometer for the measurement of fast-neutron energies has been constructed and used to measure the energy and angular distributions of 14.6-Mev neutrons scattered from Fe and C. The neutron differential cross sections for inelastic scattering from Fe were measured at theta sub CM = 50 degrees, 70 degrees, and 115 degrees. The neutron differential cross sections for elastic scattering from C and for inelastic scattering from the first level in C were measured at theta sub CM = 47 degrees and found to be 49.6 ± 3.6 and 21.8 ± 1.7 mb/ster, respectively. Total cross sections for Fe and C were measured as 2.49 ± 0.05 and 1.30 ± 0.02 barns, respectively. The energy and angular distributions of inelastically produced gamma rays from Fe and Li(7) were measured using two different types of gamma spectrometers. The differential scattering cross sections for production of the 0.845- and 1.24-Mev gamma rays and for gamma rays in the energy interval 1 < E sub gamma < 10.5 Mev from Fe were measured for nine angles of emission. The differential cross section for inelastic scattering from the 0.477-Mev level of Li(7) was measured as 7.73 ± 0.54 mb/ster at theta sub CM = 90 degrees. The calculated energy levels for Li(7) and Fe(56), using the collective model, are in good agreement with experimental values. The strong-coupling approximation is shown to be valid in both nuclei. (Author)

AD-614 452 Div. 20
CFSTI Prices: HC$4.00 MF$0.75

General Dynamics/Fort Worth, Tex. Nuclear Aerospace Research Facility.
AN INVESTIGATION OF THE THERMAL RESPONSE OF THE AEROSPACE SHIELD TEST REACTOR TO LOSS OF COOLANT.
Rept. for 1 Oct 63-30 Sep 64,
by R. A. Lawrence. Apr 65, 106p Rept. no. FZK-209
Contract AF29 601 6213, Proj. 6773, Task 677304
WL TR-64-137

Unclassified report

Descriptors: (*Test reactors, Heat transfer), (*Heat

transfer, Test reactors), (*Reactor coolants, Heat transfer), Melting, Reactor fuel plates, Reactor fuel elements, Reactor fuel rods, Air, Water, Reactor cores.

A heat-transfer model was developed and compared with experimental data. This comparison revealed that the model was conservative and that the heating rate and heat-loss rate were excessive. The experimental data were acquired from the ASTR in a series of tests that involved removal of the coolant from the reactor following operation at various power levels and operating times. It is concluded that operation conditions for threshold melting can be predicted and that fuel-element peak temperatures resulting from loss of coolant are relatively unaffected by the reactor being in either air or water. It is further concluded that overheated fuel elements can be cooled by adding water, with relatively little hazard of rupturing a fuel plate. (Author)

AD-614 493 Div. 20, 15

Imperial Coll. of Science and Tech., London (England).
PRACTICLE THEORY OF THREE-PARTICLE STATES. I. NONRELATIVISTIC,
by C. Lovelace. 20 Apr 64, 25p
Grant AF EOAR46 64, Proj. 9751, Task 9751 01
AFOSR 65-0462
Unclassified report

Pub. in The Physical Review v135 n5B pB1225-49 Sep 1964.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Nuclear particles, N-body problem), (*N-body problem, Nuclear particles), Relativity theory, Inelastic scattering, Nuclear energy levels, Nuclears, Nuclear isobars, Potential theory, Quantum mechanics, Pions, Nuclear resonance, Nuclear models, S-matrix.

Faddeev's mathematical work is used on nonrelativistic three-particle systems to obtain a practical theory of three-particle states. Each of the two-particle subsystems is assumed to be dominated by a finite number of bound states and resonances. Two sets of equations are obtained. One expresses processes with three final particles in terms of unstable-particle scattering. It generalizes and justifies the isobar model. The other is a set of coupled Lippmann-Schwinger equations for the scattering of bound states and unstable particles. The potentials in these scattering equations for composite particles are nonlocal and energy-dependent, and become complex above the three-particle threshold. They are expressed in terms of the wave functions of the two-particle bound states and resonances--there are no new arbitrary constants. The solution satisfies three particle unitarity. Unstable particles are not approximated by stable ones. The theory applies especially to 'overlapping' final-state interactions. The equations are given in detail for the 3N and N pion-pion systems in the static limit. In the latter case, the nucleon is treated as an N -pion bound state. The N pion-pion equations are solved approximately in closed form, giving analogs of the Chew-Low effective-range formula, for the coupled N -pion and N*-pion systems. (Author)

AD-614 496 Div. 20

Western Reserve Unit., Cleveland, Ohio.
MAGNETIC DIPOLE MOMENTS OF ODD-MASS NUCLEI IN THE SPHERICAL REGION,
by N. Freed and L. S. Kisslinger. 19 Jan 61, 14p
Unclassified report

Pub. in Nuclear Physics v25 n4 p611-23 1961
(Copies available only to DDC users).
Supported by AFOSR and NSF.

Descriptors: (*Nuclei, Magnetic moments), (*Magnetic moments, Dipole moments), Even-odd nuclei, Odd-even nuclei, Perturbation theory, Nuclear shell models, Nuclear spins, Operators (Mathematics).

The magnetic dipole moments of odd-mass nuclei are calculated and compared to the experimental data for nuclei with particles in the 28-126 shells, except for the deformed region of 150 < or = A < or = 190. The wave functions upon which the calculation is based are admixtures of seniority-one wave functions produced by a pairing interaction and obtained by projecting eigenfunctions of the number operator out of Bardeen-type wave functions. Perturbation theory is used to compute the seniority-three admixtures produced by a delta-function residual interaction. (Author)

AD-614 507 Div. 20

National Research Council of Canada, Ottawa (Ontario) Div. of Pure Physics.
A SIMPLIFIED PROCEDURE FOR THE ANALYSIS OF COMPLEX NUCLEAR MAGNETIC RESONANCE SPECTRA. II. THE ANALYSIS OF SYMMETRICAL TRIFLUOROBENZENE, THE AA'A''XX'X'' SYSTEM,
by R. G. Jones, R. C. Hirst, and H. J. Bernstein.
8 Oct 64, 18p Rept. no. NRC-8242
Unclassified report

Pub. in Canadian Journal of Chemistry v43 p683-99 1965 (Copies available only to DDC users).

Descriptors: (*Nuclear magnetic resonance, Analysis), (*Monocyclic compounds, Fluorine compounds), Halogenated hydrocarbons, Nuclear spins, Groups (Mathematics), Hamiltonian, Canada.

AD-614 515 Div. 20

Stanford Univ., Calif.
RADIATIVE CAPTURE OF He3 BY Li7,
by P. Paul, S. L. Blatt, and D. Kohler. 11 Sep 64, 7p
AROD 3269:9
Unclassified report

Pub. in the Physical Review v137 n3B pB493-8 8 Feb 1965 (Copies not available to DDC or Clearinghouse customers). See also AD-613 847.

Descriptors: (*Helium, Photonuclear reactions), (*Nuclear energy levels, Lithium), (*Lithium, Helium), Nuclear resonance, Decay schemes, Nuclear shell models, Differential cross section, Nuclei, Excitation, Gamma counters.

A system suitable for detection of high-energy gamma rays produced with low cross sections in the presence of high background counting rate is described. It is applied to a study of radiative capture of He3 by Li7 for bombarding energies up to 3.0 MeV. Gamma transitions to the first six states in B10 are observed and their energy dependence is measured. The excitation functions at 90 deg show peaks at 1.1 and 2.2 MeV for the transitions to the ground state and the one at 4.77 MeV, with c.m. widths of less than 500 and 420 keV, respectively. Transitions to the first and fourth excited states show a broad maximum around 1.4 MeV with a c.m. widtn of less than 600 keV. The cross section for the decay to 4.77 MeV is largest, with the differential cross section reaching 5 micro b/sr at the 2.2-MeV peak. At some excitation energies asymmetries Y(0)/Y(90) are obtained which indicate strong interferences. The peaks are interpreted as resonances and low limits on (2J+1)gamma are presented. (Author)

AD-614 537 Div. 20

Colorado Univ., Boulder.
A NOTE ON THE SIGNATURES OF THE DOMINANT REGGE TRAJECTORIES,
by Yan-chok Leung. 13 Mar 64, 10p
Grant AF AFOSR30 63
AF0SR 65-0476

Unclassified report

Pub. in Il Nuove Cimento v33 (ser. 10) p865-72 Aug 1 1964 (Copies available only to DDC users).

Descriptors: (*Particle trajectories, Elastic scattering), (*Elastic scattering, Nuclear particles), Parity, Annihilation reactions, Baryons, Nuclear spins.

By the requirements of the unitarity condition and the positive definiteness of the imaginary parts of the forward amplitudes, it is shown that the dominant Regge trajectories of amplitudes that contribute to forward scattering passing through integer values of angular momenta in the interval 0<t<4 microns squared, where t is the square of the momentum transfer and 4 microns squared is the square of the mass of the lowest intermediate state in the t-channel, must have definite signatures. This result is derived for amplitudes satisfying the Mandelstam representation. (Author)

AD-614 539 Div. 20

Enrico Fermi Inst. for Nuclear Studies, Univ. of Chicago, Ill.
SOME POSSIBILITIES FOR UNUSUAL LIGHT HYPERNUCLEI,
by R. H. Dalitz and R. Levi Setti. 2 Apr 63, 15p
Grant AF AFOSR62 358, Proj. 9751, Task 975101
AFOSR 65-0471

Unclassified report

Pub. in Il Nuovo Cimento v30 (ser. 10) p489-501 Oct 16 1963 (Copies available only to DDC users). Research supported in part by Atomic Energy Commission, Washington, D. C.

Descriptors: (*Nuclei, Nuclear properties), (*Decay schemes, Nuclei), Charged particles, Nuclear particles, Nuclear resonance, Nuclear spins, Nuclear energy levels, Hyperons, Pions.

Some possibilities are considered concerning the stability, formation, and identification of lambda-hypernuclei corresponding to core nuclei (generally with I or = 3/2) away from the stability valley. The identification of such hypernuclei may be rather informative concerning the existence and properties of such little-known nuclei. For neutron-rich species, e.g. 6H sub lambda, 8He sub lambda, etc., the possible confusions of their major decay modes with (and their separation from) similar well-established modes of more abundant hypernuclei are discussed. The expectation that narrow resonance levels (with lifetimes or = 10 to the -21 power s) should exist for certain hypernuclear systems (e.g. the p -4He sub lambda system) is also mentioned briefly, since the production and observation of such resonance states could be achieved with existing techniques. (Author)

AD-614 549 Div. 20, 2

Seattle Pacific Coll., Wash. Inst. for Research.
COSMIC-RAY HEAVY NUCLEI AT THE GEOMAGNETIC EQUATOR,
by D. D. Kerlee, O. K. Krienke, Jr., J. J. Lord, and M. E. Nelson. 16 Oct 59, 3p
Grant NSF G10695

Unclassified report

Pub. in Physical Review v118 n3 p828-30 May 1 1960 (Copies not available to DDC or Clearinghouse customers). Research supported in part by Office of Naval Research, Washington, D. C., and U. S. IGY Proj.

Descriptors: (*Cosmic rays, Nuclei), (*Nuclei, Nuclear properties), (*Upper atmosphere, Cosmic rays), Terrestrial magnetism, Sunspots, Charged particles, Photographic emulsions.

The flux of primary cosmic-ray heavy nuclei was measured with a sandwich of C-2 and G-5 emulsions near the island of Guam, magnetic latitude 4 deg N. The emulsions were exposed at about 101,000 ft for 7.3 hours and the calculated fluxes at the top of the atmosphere in particles/sq m-sec-sr were found to be: Li, Be, B (L nuclei) 0.26±0.05, C, N. O, F (M nuclei) 0.66±0.10, Z> or = 10 (H nuclei) 0.37±0.09. This flight took place on February 12, 1957, about a year prior to the sun spot maximum; however, there is not evidence within statistical error for any changes in the composition of the primary heavy nuclei. (Author)

21. Nuclear Propulsion

AD-613 998 Div. 21, 20
CFSTI Prices: HC$1.00 MF$0.50

Douglas Aircraft Co., Inc., Santa Monica, Calif.
CAVITY NUCLEAR REACTORS,
by R. J. Holl and T. F. Plunkett. 11 Jul 63, 17p
Douglas paper no. 1738

Unclassified report

Descriptors: (*Nuclear reactors, Spacecraft nuclear propulsion), (*Spacecraft nuclear propulsion, Nuclear reactors), Space propulsion, Reactor cores, Critical assemblies, Theory, Nuclear reactors, Reactor fuels, Design, Reactor materials, Cylindrical bodies, Exhaust nozzles, Vortices, Power reactors.

A nuclear analysis was performed for cavity nuclear reactors suitable for space propulsion. Calculational methods were evaluated and multigroup diffusion theory was selected. A survey in spherical geometry evaluated reflector materials, nuclear fuels, reactor dimensions, and temperature effects. Two-dimensional results for a finite cylindrical reactor are included. The study showed that extremely high fuel loadings were required for a propulsion reactor. (Author)

22. Ordnance

AD-613 935 Div. 22
CFSTI Prices: HC$1.00 MF$0.50

Bureau of Mines, Pittsburgh, Pa.
STRESS WAVES IN BOUNDED MEDIA.
Quarterly rept. no. 1, 1 Dec 64-28 Feb 65,
by Richard W. Watson, Karl R. Becker, and
Frank C. Gibson. 8 Apr 65, 15p

Unclassified report

Descriptors: (*Projectiles, Stresses), (*Stresses, Projectiles), (*Targets, Penetration), (*Shock waves, Ballistics), Explosion effects, Detonations, Cameras, Liquids, Velocity.

The purpose of the program will be to explore in detail, from a fundamental aspect, phenomena associated with the interaction of intense stress waves at the free boundaries of simple media or at the interfaces between different media. Stresses generated by detonating explosives or from impact by high-velocity objects are of prime interest. The development of new methods and techniques for the solution of these problems is planned as an integral part of the program.

AD-613 937 Div. 22
CFSTI Prices: HC$2.00 MF$0.50

Naval Ordnance Lab., White Oak, Md.
MECHANICAL ZERO G DEVICE,
by Lewis D. Silvers, Jr. 31 Dec 64, 27p
NOLTR-64-127
Proj. 732, Tasks RREN04004 212 1F008 21 002,
RREN04322 212 2F008 21 02

Unclassified report

Descriptors: (*Weightlessness, Monitors), (*Monitors, Weightlessness), (*Arming devices, Guided missiles (Surface-to-Surface)), Guided missile safety, Mechanical engineering, Proximity devices, Solenoids.

A working model of a mechanical device for sensing zero g or weightlessness has been developed. It is approximately 1-3/4 inches X 2 inches X 4-1/2 inches high and weighs 1.2 pounds. It requires electrical energy to energize a rotary solenoid which releases a self-starting timer. It arms in all planes at a g level below .15 and remains safe in all planes at a g level above .30. The present design will run for 39 seconds and sense the g level during the last 25 seconds. Six switches are positioned around a circular circuit disc for telemetering purposes. This model, which was designed and fabricated for flight on a missile in order to prove its feasibility, could be easily adapted to a particular missile by changing the timer and switching. (Author)

AD-614 262 Div. 22, 2
CFSTI Prices: HC$2.00 MF$0.50

Naval Weapons Lab., Dahlgren, Va.
SOURCES OF METEOROLOGICAL DATA FOR WEAPONS SYSTEMS STUDIES.
Technical memo,
by Robert M. Fenn. Apr 65, 31p
Rept. no. K-34/65

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Meteorology, Research program administration), (*Ballistics, Meteorological parameters), (*Weapon systems, Meteorology), Scientific organizations, Bibliographies, Ordnance, Naval equipment.

A previous report, (Recent Trends in Meteorological Literature and Their Relation to Naval Weapons Systems, AD-609 968) discussed the changes which have occurred in the science of meteorology during the past ten years, as shown by a review of the literature of that period. This report describes the principal scientific organizations which furnished much of that literature. The information was obtained from a number of sources over a two-year period. Since much of it was obtained through personal contacts and meetings of various professional groups, it is impossible to credit all sources of data. Major sources are shown in the list of references. The opinions expressed are those of the author.

23. Personnel and Training

AD-614 224 Div. 23
CFSTI Prices: HC$1.00 MF$0.50

Data-Design Labs., Ontario, Calif.
DEVELOPMENT OF TEST ITEMS FOR OFFICER SELECTION AND CLASSIFICATION BATTERIES.
Quarterly progress rept. no. 1, 15 Dec 64-15 Mar 65.
15 Mar 65, 2p
Contract AF41 609 2743, Proj. 7719, Task 771906

Unclassified report

Descriptors: (*Officer personnel, Selection), Preparation, Tests.

AD-614 316 Div. 23, 28

American Inst. for Research, Palo Alto, Calif.
SELF-EVALUATIONAL RESPONDING AND TYPOGRAPHICAL CUEING: TECHNIQUES FOR PROGRAMING SELF-INSTRUCTIONAL READING MATERIALS,
by Wayne Hershberger. 17 Feb 64, 9p
Contract Nonr307700

Unclassified report

Pub. in Journal of Educational Psychology v55 n5 p288-96 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Learning, Reading), (*Education, Applied psychology), Retention, Reaction (Psychology), Students, Psychometrics, Factor analysis, Effectiveness.

The study assessed the effects of complex typographical cueing (high-lighting essential lesson content) and self-evaluational response items (quizzing the reader on the essential content) upon the learning and retention of both enrichment and essential lesson content for both discursively and tersely written texts. A total of 160 pretested fifth-grade students read lessons on history and science and took immediate and delayed posttests on each topic. Analysis of gain scores revealed that: (a) self-evaluational response items reliably enhance learning and retention of essential content without detracting from enrichment content, (b) complex typographical cueing fails to increase learning of either type of content, and (c) omitting the enrichment content (i.e., terse text) reduces reading time but not amount learned. (Author)

AD-614 317 Div. 23, 28

American Inst. for Research, Palo Alto, Calif.
TYPOGRAPHICAL CUING IN CONVENTIONAL AND PROGRAMED TEXTS,
by Wayne A. Hershberger and Donald F. Terry.
20 Mar 64, 6p
Contract Nonr307700

Unclassified report

Pub. in Journal of Applied Psychology v49 n1 p55-60 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Learning, Reading), (*Reading, Training devices), (*Training devices, Reading), Retention, Education, Students, Performance tests, Errors, Analysis of variance, Applied psychology.

This study assessed the instructional effectiveness of simple and complex forms of typographical cuing in both conventional and programed texts. A total of 118, pretested, 8th-grade students read an 8th-grade history lesson and were later retested. Analysis of gain scores revealed that: (a) simple typographical cuing distinguishing core from enrichment content enhances the ratio of important to unimportant content learned without affecting the total amount learned; (b) complex typographical cuing distinguishing 5 categories of lesson content fails to increase learning of either core or enrichment content; (c) the programed or quizzed text is more effective than the conventional text; and (d) the effects of simple typographical cuing and programed quizzing appear independent and additive. (Author)

AD-614 400 Div. 23, 28
CFSTI Prices: HC$1.00 MF$0.50

Army Personnel Research Office. Office of the Chief Research and Development, Washington, D. C.
RESTANDARDIZATION OF THE ARMED FORCES WOMEN'S SELECTION TEST, AFWST 5 AND 6,
by Leonard C. Seeley. Mar 65, 20p
Technical research rept. no. TRR-1141
Proj. 2J024701A722

Unclassified report

Descriptors: (*Armed forces personnel, Selection), (*Psychometrics, Standardization), Aptitude tests, Training, Females, Humans.

Since operational conversion tables for the Armed Forces Women's Selection Test (AFWST-5 and -6)--based on a 1961 Air Force standardization--appeared to be scaled somewhat high for WAC potential enlistees, research was undertaken to bring the norms up to date. The tests were restandardized on a sample of 400 WAC enlisted women going through basic training at the WAC Center, and the new norms instituted. As a further evaluation, the basic trainee sample was doubled by including 400 women entering basic training in succeeding classes, and norms were again computed, this time on the larger group. Data were also obtained on 1000 examinees processed at Armed Forces Examining Stations in order to include rejected applicants, and norms were computed on the wider range sample. At the same time, data were obtained by which to analyze the effectiveness of the AFWST as predictor of performance in basic training and in a clerical training course. In the conversion based on the first WAC basic training sample, percentile scores for a given raw score were higher than in the earlier Air Force conversion, and permitted acceptance of a larger percentage of applicants. The two subsequent conversions based on WAC samples were almost identical with the first. The AFWST was found to be an effective predictor of academic grade in basic training. With respect to the clerical course, prediction was substantial both for academic grade and for total grade. (Author)

24. Photography and Other Reproduction Processes

AD-613 942 Div. 24, 15
CFSTI Prices: HC$3.00 MF$0.75

RAND Corp., Santa Monica, Calif.
A GUIDE TO THE TYPING OF MATHEMATICAL NOTATION,
by Dorothy G. Stewart. Nov 64, 58p
Rept. no. P-3090

Unclassified report

Descriptors: (*Instruction manuals, Printing), (*Mathematics, Printing), Typewriters.

Rules are set forth to help technical typists convert handwritten symbols into an intelligible printed form. Instructions are given for typing symbols and fractions, what spacing to use, and the arrangement of equations.

AD-614 398 Div. 24
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
HIGH-SPEED COLOR PHOTOGRAPHY OF SELF-LUMINOUS PROCESSES,
by V. V. Garnov and V. V. Shauro. 30 Mar 65, 15p
FTD-TT-65-220
TT 65-62074

Unclassified report

Unedited rough draft trans. of Zhurnal Nauchnoi i Prikladnoi Fotografii i Kinematografii (USSR) v8 n4 p270-5 1963.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*High-speed photography, Illumination), (*Color photography, Illumination), Color film, Photoflash ammunition, Illuminating projectiles, High-explosive ammunition, Motion picture film, Stereoscopic photography, USSR.

Conclusions: (1) The possibility has been demonstrated of using DS-2v color film in high-speed photography of self-luminous processes over a wide range of film speed (25 to 625 thousand frames/sec) and a luminosity temperature of 2500 to 6000 degrees K. (2) The most flexible and simplest method of developing color film which satisfies the requirements of high-speed photography and accessibility to a wide circle of investigators was selected and put into practice. (3) A check was made of the optimum exposure regime using a layer of thallium yielding a three- to fourfold increase in sensitivity (S-0.85) at a fog level D < or = 0.35. (4) The possibility of obtaining color motion picture films (normal and stereoscopic) as well as prints on color paper and positive film of high-speed, self-luminous processes was demonstrated. (Author)

25. Physics

AD-613 933 Div. 25, 4
CFSTI Prices: HC$1.00 MF$0.50

Tufts Univ., Medford, Mass.
DIELECTRIC DISPERSION.
Quarterly status rept. no. 14, 1 Oct-31 Dec 64,
by Karl H. Illinger. 31 Dec 64, 3p
Contract Nonr49419, Proj. NR014 204
Unclassified report

Descriptors: (*Microwave spectroscopy, Spectrum analyzers), (*Dielectric properties, Microwave spectroscopy), Line spectrum, Circuits, Microwave equipment, Diatomic molecules.

Modifications are described which were incorporated into a 8.2 - 40 kmc broadband microwave spectrometer in order to increase its accuracy in the measurement of the shapes and intensities of collision-broadened microwave lines.

AD-613 961 Div. 25, 8, 14, 17
CFSTI Prices: HC$3.00 MF$0.75

Lincoln Lab., Mass. Inst. of Tech., Lexington.
SOLID STATE RESEARCH.
Quarterly progress rept. for 1 Oct-31 Dec 64,
by H. C. Gatos. 23 Mar 65, 79p
Contract AF19 628 500
ESD TDR-65-31
Unclassified report

Descriptors: (*Solid state physics, Reviews), (*Lasers, Solid state physics), (*Magnetic resonance, Solid state-physics), (*Spectroscopy, Solid state physics), Luminescence, Gallium alloys, Arsenic alloys, Diodes (Semiconductor), Crystals, Adsorption, Lead alloys, Indium alloys, Selenium alloys, Antimony alloys, Ruby, Mercury, Crystal growth, Sapphire, Iodine, Titinium, Antimony, Bismuth, Germanium, Silicon, Lithium, Spinels, Attenuation, Acoustics, Spin, Photons, Superconductivity, Semiconductors.

This report covers in detail the solid state research work at Lincoln Laboratory for the period 1 October 1964 through 31 December 1964. The topics covered are Solid State Device Research, Laser Research, Materials Research, Band Structure and Spectroscopy of Solids, and Magnetism and Resonance. (Author)

AD-613 963 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

American Optical Co., Southbridge, Mass.
NEODYMIUM LASER GLASS IMPROVEMENT PROGRAM.
Technical summary rept. no. 5, 30 Jun 64-1 Jan 65,
by Richard F. Woodcock. Apr 65, 17p
Contract Nonr383500, ARPA Order 306 64
Unclassified report

See also AD-610 876.

Descriptors: (*Lasers, Glass), (*Neodymium compounds, Lasers), (*Glass, Neodymium compounds), Refractive index, Thermal expansion, Rods, Optics.

During this period the main area of investigation was concerned with athermalizing laser glass. The effects of composition on the expansion coefficient, the thermal coefficient of the index of refraction, the birefringence and the stress-optical coefficients were studied for this purpose. In summary, it is felt that an athermalized laser system can be produced by counterbalancing the index of refraction changes produced by stress with index changes produced by temperature directly. Systems using both Pockels type and non-Pockels type glasses were considered.

AD-613 967 Div. 25, 26, 30
CFSTI Prices: HC$3.00 MF$0.75

Cryogenic Engineering Lab., Mass. Inst. of Tech., Cambridge.
THE PRODUCTION OF INTENSE MAGNETIC FIELDS BY MEANS OF LIQUID NITROGEN COOLED COPPER COILS.
Final rept. for Nov 60-Dec 64,
by D. W. Almgren and R. D. Cummings. Feb 65, 84p
Contract AF19 604 7460, Proj. 8608, 8659, Tasks 860804, 865902
AFCRL 65-1
Unclassified report

Descriptors: (*Cryogenics, Magnetic fields), (*Coils, Manufacturing methods), (*Magnetic fields, Production), Electromagnets, Solenoids, Liquefied gases, Nitrogen, Coolants, Copper, Heat transfer, Design, Low-temperature research, Pumps, Liquid filters, Thermal insulation, Performance (Engineering), Configuration.

The investigation was undertaken to study the problem of production of intense, continuous magnetic fields using low temperature coils. Using a standardized 5 in O.D. 2-1/2 in wide solenoid configuration, a variety of coolant passage geometries and coil manufacturing techniques for producing coolant passages were tested. The solenoids are evaluated on the basis of cooling ability (power dissipated for a maximum flux density) and ease of manufacture. With liquid nitrogen being supplied at a rate of approximately 50 GPM, a maximum flux density of 77 kilogauss was measured in a .5 in air bore while dissipating 86 kilowatts of power. (Author)

AD-613 968 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Perkin-Elmer Corp., Norwalk, Conn. Electro-Optical Div.
TUNABLE COHERENT LIGHT SOURCE.
Quarterly progress rept. for 1 May-31 Jul 64,
by N. I. Adams. 31 Jul 64, 12p Rept. no. PE-TR-7776
Contract Nonr457200, Proj. NR015 705
Unclassified report

See also AD-613 080.

Descriptors: (*Optics, Lasers), (*Lasers, Gases), (*Light, Lasers), Mixtures, Helium, Neon, Argon, Light transmission, Gain, Measuring devices (Electrical and Electronics), Oscillators, Tuning devices.

The purpose of this program is to conduct research toward the development of a tunable coherent source based on nonlinear optical effects, to demonstrate a tunable coherent light source, and to demonstrate parametric gain at optical frequencies. Work was continued as follows: (1) An experiment to produce an optical difference frequency between two gas lasers; (2) development of a calibrated optical marginal oscillator for the detection and measurement of a small amount of optical parametric gain; (3) development of quantitative theory for optical parametric effects; and (4) development of improved technology and components for experimental work in nonlinear optics.

AD-613 977 Div. 25, 17
CFSTI Prices: HC$2.00 MF$0.50

Illinois Univ., Urbana. Dept. of Physics.
FERROMAGNETISM IN THE TRANSITION METALS,
by J. L. Beeby. 1965, 45p
Contract Nonr183412

Unclassified report

Descriptors: (*Ferromagnetism, Transition elements), (*Transition elements, Ferromagnetism), Alloys, Magnetic properties, Crystal lattices, Atomic energy levels, Electron transitions, Partial differential equations, Impurities, Correlation techniques, Electrons.

It has been shown that a model in which the saturation magnetisation of an alloy is dependent on the s-d admixture can lead to resonable agreement with experiment. In order to calculate the changes in saturation magnetisation it was necessary to put forward a model for the origin of the ferromagnetism. This model, though very crude, nevertheless suggests important differences between the b.c.c. and f.c.c. lattices, principally in the behavior of the electron-electron correlation energy. Regarding the correlation energy as being the dominant effect in determining the stable lattice structure leads to the correct ranges of stability for the lattice structure as e/a varies for both the ferromagnetic and non-ferromagnetic series. It is clear that an improved version of the itinerant electron model calculation is necessary. This should include the hybridisation of the bands, both s- and d-bands being those for the alloy in question. Some model of the exchange energy must be postulated. Even in the absence of such a first principle calculation of the exchange energy, it is evident that the existing experimental data, especially that concerning the alloys, contains a great deal of information which can be used to resolve some of the remaining difficulties concerning the d-electrons. (Author)

AD-613 980 Div. 25, 2, 8
CFSTI Prices: HC$1.00 MF$0.50

American Meteorological Society, Boston, Mass.
SIMULATION OF PARTICLE MOTION IN INTERSECTING ELECTRIC AND MAGNETIC FIELDS,
by N. V. Trikhanova and P. M. Shchanin. Sep 64, 9p Rept. no. T-R-450
Contract AF19 628 3880
TT 65-61979

Unclassified report

Modelirovanie Dvizheniya Chastits v Perekreshchivayushchikhsya Elektricheskom i Magnitnom Polyakh, trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fizika (USSR) n3 p3-6 1964.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Particle trajectories, Simulation), (*Electric fields, Particle trajectories), (*Magnetic fields, Particle trajectories), Electrodes, Analog computers, Numerical analysis, USSR.

The motion of particles in intersecting electric and magnetic fields that vary in the direction of movement of the particles is simulated. The trajectories of particles with different initial conditions at the input are given. (Author)

AD-613 984 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Army Engineer Research and Development Labs., Fort Belvoir, Va.
GROWTH OF SINGLE-CRYSTALS NEMATIC FILMS,
by I. G. Chistyakov. 1965, 10p
Rept. no. T-1781-65
TT 65-61982

Unclassified report

Rost Monokristal'nykh Nematicheskikh Plenok, trans. of Rost Kristallov (USSR) v4 p74-80 1964.

Descriptors: (*Single crystals, Crystal growth), (*Crystal growth, Crystal lattice defects), (*Liquids, Crystals), (*Crystal lattice defects, Films), Impurities, Melting, Organic nitrogen compounds, Ethers, USSR.

A study was made of the mechanism of formation of disinclinations (analogs of dislocations in solid crystals) in the course of the growth of liquid single-crystal nematic films of p-azoxyanisole and p-azoxyphenetole. A classification of disinclinations is given and the growth processes is described in detail. It was found that the growth and fusion of a liquid crystal are substantially affected by various defects of the walls which confine the liquid crystal film and extraneous inclusions in the form of solid dust particles.

AD-613 985 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Army Engineer Research and Development Labs., Fort Belvoir, Va.
TYPE OF GROWTH AND PROPERTIES OF LIQUID CRYSTALS OF THIAZINE DYES,
by N. M. Melankholin. 1965, 11p Rept. no. T-1783-65
TT 65-61983

Unclassified report

Forma Rosta i Svoistva Zhidkikh Kristallov Tyazinovykh Krasitelei, trans. of Rost Kristallov (USSR) v4 p61-7 1964.

Descriptors: (*Liquid crystals), (*Crystal growth, Liquids), (*Dyes, Crystal growth), Films, Physical properties, Methylene blue, Optical properties, USSR.

A study was made of the growth and transformations in liquid crystals of a number of thiazine dyes, and it was established that these processes are different in different dyes. The dyes examined were: Novomethylene blue, methylene green, Methylene blue, toluidine blue, thionine blue, and thionine violet.

AD-613 986 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Army Engineer Research and Development Labs., Fort Belvoir, Va.
VITRIFIED LIQUID-CRYSTAL FILMS,
by I. G. Chistyakov and E. A. Kosternin. 1965, 9p
Rept. no. T-1782-65
TT 65-61984

Unclassified report

O Zasteklovannykh Zhidkokristallicheskikh Plenkakh, trans. of Rost Kristallov (USSR) v4 p68-73 1964.

Descriptors: (*Liquids, Crystals), (*Crystal structure, Liquids), (*Films, Microstructure), Glass, Optical properties, Surface properties, Plechroism, Benzoates, Organic nitrogen compounds, Cholesteryl esters, USSR.

Results are given of a study of the textures of liquid crystals which had been vitrified in the form of films. Substances of the smectic (protagon), nematic (ethyl p-n-dimethylaminobenzene-1-aminonaphthalene-4-

azobenzoate) and cholesteric (cholesteryl cinnamate) types were examined.

AD-613 996 Div. 25
CFSTI Prices: HC$3.00 MF$0.75

Massachusetts Inst. of Tech., Cambridge.
SOLID-STATE AND MOLECULAR THEORY GROUP.
Quarterly progress rept. no. 56.
15 Apr 65, 77p
Contract Nonr184134, AF19 628 356
Unclassified report

See also AD-610 491.

Descriptors: (*Solid state physics, Scientific research), (*Crystal lattices, Electron transitions), (*Molecular properties, Field theory), (*Cryogenics, Mathematical analysis), Brass, Copper compounds, Oxides, Potassium compounds, Chlorides, Atomic energy levels, Brillouin zones, Atomic orbitals, Integrals, Liquefied gases, Statistical mechanics, Superconductors, Thermal conductivity, Transition temperature.

Contents: Survey, Energy bands in beta-brass, by F. Arlinghaus, Energy bands in cuprous oxide, by J. P. Dahl and A. C. Switendick, Self-consistent energy bands for potassium chloride, by P. DeCicco, Evaluation of molecular integrals, by D. E. Ellis and P. Ros, On the application of statistical mechanics, by Leon Gunther, On the possibility of a discontinuity in the thermal conductivity of superconductors at the transition temperature, by Leon Gunther.

AD-614 007 Div. 25, 8
CFSTI Prices: HC$1.00 MF$0.50

Electrical Engineering Research Lab., Univ. of Illinois, Urbana.
STUDIES IN QUANTUM AND SOLID STATE ELECTRONICS.
Final rept. for 1 Feb 63-1 Feb 65,
by P. D. Coleman. 1 Feb 65, 7p
Grant AF AFOSR272 63, Proj. 9768
AFOSR 65-0661
Unclassified report

Descriptors: (*Ruby, Pumping (Electronics)), (*Hydrogen compounds, Cyanides), (*Radiofrequency spectroscopy, Millimeter waves), (*Lasers, Photoconductivity), Quantum mechanics, Solid state physics, Masers, Microwave equipment, Resonators, Fluorescence, Crystals, Electronics.

(1) OPTICAL PUMPING IN DARK RUBY: Attempts were made to get maser action in the submillimeter region by incoherent optical pumping in a solid. The absorption of thermal noise power in a microwave resonator by an appropriate crystal therein is regarded as capable of changing the fluorescent intensity in the crystal. The terminal level of the fluorescent line must be one of the levels between which there is microwave absorption. (2) HARMONIC GENERATION IN HCN BY MULTIPLE QUANTUM CONVERSION: A traveling wave interaction in a 2.5-meter section of RG 96/U waveguide containing HCN gas produced a peak power at 104.1 Gc of 1.8 watts. (3) SUBMILLIMETER-WAVE SPECTROSCOPY: A submillimeter wave monochromator was designed and constructed that is capable of covering the spectral region from 100 microns out to about 2.5 mm in wavelength. (4) MIXING OF LASER LIGHT IN A BULK PHOTOCONDUCTOR. Beat notes of 3 Gc were detected on production by Fabry-Perot mode frequencies of a laser when mixed in a bulk photoconductor and compared with previous results.

AD-614 015 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
SPEED OF SOUND IN TWO-PHASE MEDIA,
by M. E. Deich, G. A. Filippov, and E. V. Stekol'shchikov. 26 Mar 65, 13p FTD-TT-64-1030
TT 65-61987
Unclassified report

Unedited rough draft trans. of Teploenergetika (USSR) v11 n8 p33-6 1964.

Descriptors: (*Sound transmission, Velocity), (*Phase studies, Sound transmission), Vapors, Liquids, Thermodynamics, Mechanics.

Results are given of experimental and theoretical investigations of the speed of sound in two-phase media.

AD-614 026 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
STABILITY OF A FLAT LAYER OF IDEALLY-CONDUCTING VISCOUS FLUID IN A LONGITUDINAL MAGNETIC FIELD,
by G. A. Glonti. 26 Mar 65, 6p FTD-TT-65-16
TT 65-62001
Unclassified report

Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fizika (USSR) n6 p169-70 1962.

Descriptors: (*Magnetohydrodynamics, Stability), Equations, Damping, Magnetic fields, Electrical conductance, USSR.

Equations are developed for the stability of a flat layer of ideally-conducting viscous fluid in a longitudinal magnetic field.

AD-614 029 Div. 25, 15
CFSTI Prices: HC$4.00 MF$1.00

Naval Ordnance Lab., White Oak, Md.
THE GENERALIZATION OF HAMILTON'S MECHANICS. I. THEORY OF HOMOGENEOUS CONTACT TRANSFORMATIONS,
by D. Jane Roberg. 6 Jan 65, 146p
NOLTR-64-194
Proj. R360FR105R011 01 01
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC.
Copy is available for public sale.

Descriptors: (*Mechanics, Transformations (Mathematical)), (*Transformations (Mathematical), Mechanics), (*Projective geometry, Mechanics), Tensor analysis, Quantum mechanics, Time, Hamiltonian, Identities, Partial differential equations, Relativity theory.

Hamilton's mathematical theory of mechanics has been recast into a new form, based on the homogeneous contact transformation. A method has been found for representing analytically a certain class of geometries associated with groups of transformations including homogeneous contact transformations. All these trans-

formations are characterized by the fact that they leave invariant a particular constant tensor; the representation of the identical transformation completes the basis of the gedometry. Tensor analysis has been developed and provides the framework for a more extensive physical theory. (Author)

AD-614 031 Div. 25, 20
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
INVARIANT IMBEDDING AND A REFORMULATION OF THE INTERNAL INTENSITY PROBLEM IN TRANSPORT THEORY,
by R. E. Bellman, H. H. Kagiwada, and R. E. Kalaba.
Apr 65, 23p Rept. no. RM-4539-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Integral equations, Transport properties), (*Transport properties, Integral equations), Numerical analysis, Algebra, Differential geometry, Invariance, Neutron transport theory.

Modern electronic computers can integrate in the order of one thousand simultaneous nonlinear ordinary differential equations, given a complete set of initial conditions. One of the aims of the theory of invariant imbedding is to show how to use this capability to resolve significant problems in transport theory. In the present paper the authors show how to compute internal intensities when a finite homogeneous slab is illuminated by uniform parallel rays of radiation. It is assumed that there is absorption and isotropic scattering in the slab. (Author)

AD-614 038 Div. 25, 10, 21
CFSTI Prices: HC$3.00 MF$0.75

General Dynamics/Fort Worth, Tex.
COLD-NEUTRON SCATTERING CROSS SECTION OF LIQUID HYDROGEN BASED ON A CONSISTENT-VIBRATIONS LIQUID MODEL.
Rept. for 1 Oct 63-30 Sep 64,
by H. G. Carter. Mar 65, 59p Rept. no. FZK-199
Contract AF29 601 6213, Proj. 6773, Task 677301
WL TR-64-161

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Neutron scattering, Hydrogen), (*Hydrogen, Molecular properties), (*Liquefied gases, Hydrogen), Oscillators, Vibration, Kinetic theory, Elastic scattering, Inelastic scattering, Neutron cross sections, Thermodynamics, Liquid rocket propellants, Quantum mechanics, Excitation, Cryogenics, Mathematical models, Spacecraft nuclear propulsion.

Expressions for the elastic and inelastic slow-neutron cross sections of liquid hydrogen are derived, with liquid effects accounted for on the basis of a harmonic oscillator model. It is assumed that the molecules can be regarded as rigid rotators, the centers of mass of which execute quantized harmonic motions about central sites in a liquid quasi-lattice. A consistent-vibrations liquid model presented in AD-614 039, provides the state-dependent vibration parameters and the neighbor distributions resulting from thermal disorder. The derived cross sections may be divided into diffuse and interference parts. Insofar as the molecular motion conforms to a system of independent oscillators, the inelastic scattering, which may result from rotational molecular excitation, from excitation of a quantum level of the center-of-mass motion, or from both processes simultaneously, is purely incoherent. The interference scattering is found to be independent of the relative concentrations of para- and orthohydrogen. Calculated para-hydrogen cross sections for various inelastic processes associated with the scattering of 0.065-ev neutrons through 90 degrees are compared with a published experimental spectrum. (Author)

AD-614 039 Div. 25, 10, 21
CFSTI Prices: HC$3.00 MF$0.75

General Dynamics/Fort Worth, Tex.
A CONSISTENT-VIBRATIONS MODEL OF THE INTERNAL DYNAMICS OF LIQUID HYDROGEN.
Rept. for 1 Oct 63-30 Sep 64,
by H. G. Carter. Mar 65, 63p Rept. no. FZK-197
Contract AF29 601 6213, Proj. 6773, Task 677301
WL TR-64-162

Unclassified report

Descriptors: (*Liquid rocket propellants, Radiation damage), (*Liquefied gases, Hydrogen), (*Hydrogen, Molecular properties), Free radicals, Reaction kinetics, Recombination reactions, Chemical bonds, Phase studies, Thermodynamics, Entropy, Vibration, Neutron cross sections, Spacecraft nuclear propulsion, Excitation, Crystal lattices, Mathematical models, Quantum mechanics, Statistical mechanics, Temperature, Density.

A model describing the internal dynamics of a non-associated liquid was constructed for use in the calculation of cold-neutron scattering cross sections and free-radical recombination rates in liquid hydrogen. The proposed model assumes that the specification of a given temperature and density implies a quiescent state in which each molecule vibrates with random phase in a field set up by the sum of the position probability densities of its neighbors, the central sites of which comprise a close-packed quasi-lattice. A computer program was written to calculate the consistent vibration frequency, the molecular well depth, the internal energy, the entropy, and the free energy of a liquid with a given temperature and density and with known Lennard-Jones parameters of the intermolecular interaction. Application of the program to the case of liquid hydrogen at points on the P-V-T surface ranging from 20 to 28K along the saturation line gave predictions of thermodynamic properties which are in good agreement with experimental data. It is tentatively concluded that the model anticipates the most signigicant general features of motion in the liquid and may be implemented in calculations of cross sections and recombination rates which are dependent on the details of the internal dynamics and microscopic structure. (Author)

AD-614 044 Div. 25, 9
CFSTI Prices: HC$2.00 MF$0.50

Illinois Univ., Urbana. Dept. of Physics.
GREEN'S FUNCTIONS AND SUPERFLUID HYDRODYNAMICS,
by Joseph W. Kane and Leo P. Kadanoff. 1965, 41p
Contract Nonr183412

Unclassified report

Descriptors: (*Hydrodynamics, Green's function), (*Cryogenics, Hydrodynamics), Thermodynamics, Entropy, Numerical analysis, Momentum, Energy, Fluid mechanics, Statistical mechanics, Quantum mechanics.

An examination is made of the nonequilibrium behavior of superfluid systems using the techniques of thermodynamic Green's functions.

AD-614 049 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Innsbruck Univ. (Austria).
THE HISTORICAL DEVELOPMENT OF THE SPINOR THEORY IN THE RIEMANNIAN GEOMETRY (SURVEY ON THE PUBLISHED LITERATURE),
by Walter Majerotto and P. Unteregger. 3 Oct 64, 16p Special Scientific rept. no. SSR-9
Contract DA91 591EUC2947

Unclassified report

See also AD-606 322.

Descriptors: (*Relativity theory, Differential geometry), (*Differential geometry, Relativity theory), Reviews, Tenor analysis, Algebraic topology, Transformations (Mathematics), Spin, Momentum.

AD-614 050 Div. 25, 9
CFSTI Prices: HC$1.00 MF$0.50

Innsbruck Univ. (Austria).
INTERPRETATION OF MAGNETOGASDYNAMIC FLOW PATTERNS,
by Helmut Friedel. 25 Apr 64, 17p
Scientific rept. no. SR-10
Contract AF61 052 675
NP 14785; N64 23222

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Magnetohydrodynamics, Two-dimensional flow), (*Plasma physics, Magnetohydrodynamics), Potential theory, Transformations (Mathematics), Tables, Fluid mechanics.

For a twodimensional potential flow of an inviscid, neutral plasma of infinite conductivity, a potential equation was given which was transformed from the flow plane into the hodograph plane by means of a Legendre transformation. Using the graphic representation of these characteristics and the velocity curves, twodimensional MGD problems were solved in analogy to the Prandtl Busemann method of gasdynamics.

AD-614 051 Div. 25, 9
CFSTI Prices: HC$1.00 MF$0.50

Innsbruck Univ. (Austria).
APPLICATION OF VARIATIONAL METHODS FOR THE SOLUTION OF GASDYNAMIC AND MAGNETOGASDYNAMIC PROBLEMS.
Facsimile rept.,
by F. Cap and G. Muller. 25 Feb 64, 6p
Scientific rept. no. SR-8
Contract AF61 052 675
NP 14784; N64 22971

Unclassified report

See also AD-614 050.

Descriptors: (*Plasma physics, Magnetohydrodynamics), (*Magnetohydrodynamics, Calculus of variations), Subsonic flow, Supersonic flow, Phase studies, Compressible flow, Cylindrical bodies, Potential theory, Fluid mechanics.

A change from subsonics to supersonics involves a change in the type of potential equations of gasdynamics and magnetogasdynamics. This makes a uniform solution impossible. In the corresponding variational principle this difficulty does not arise. Thus, a uniform method of solution is possible for the subsonic domain as well as for the supersonic domain. (Author)

AD-614 052 Div. 25, 9
CFSTI Prices: HC$1.00 MF$0.50

Innsbruck Univ. (Austria).
SOME PRACTICAL EXAMPLES OF ONE DIMENSIONAL UNSTEADY POTENTIAL FLOWS IN MGD.
Facsimile rept.,
by Ferdinand Cap and Franz Herrnegger. 14 Jun 64, 16p Scientific rept. no. SR-11
Contract AF61 052 675
NP 14789; N64 32341

Unclassified report

See also AD-614 051.

Descriptors: (*Magnetohydrodynamics, One-dimensional flow), (*Plasma physics, Magnetohydrodynamics), Nonequilibrium flow, Potential theory, Graphics, Fluid mechanics, Tables.

A closed tube at a high inner pressure is considered, where, after opening the tube, pressure leveling occurs by a bundle of rarefaction waves.

AD-614 053 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Innsbruck Univ. (Austria).
SHOCK WAVES.
Facsimile rept.,
by F. Cap and F. Herrnegger. 9 Sep 64, 10p
Scientific rept. no. SR-13
Contract AF61 052 675
NP 14787

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Shock waves, Plasma physics), (*Plasma physics, Shock waves), Magnetohydrodynamics, Propagation, Magnetic fields, Electric fields, Boundary value problems, Differential geometry.

The law of conservation of momentum, energy, and mass, the continuity of the tangential component of the electric field strength measured in the moving coordinate system, and the continuity of the normal component of the magnetic field are derived from the basic plasma equations. Parallel and oblique shock waves are considered. The evolutionary condition and the shock polar diagram are discussed.

AD-614 054 Div. 25
CFSTI Prices: HC$2.00 MF$0.50

Honeywell Research Center, Hopkins, Minn.
MECHANICAL PROPERTIES OF POLYCRYSTALLINE SODIUM CHLORIDE,
by R. J. Stokes. Mar 65, 42p
Technical rept. TR-28, HR-65-256
Contract Nonr407600, Proj. NR032 451

Unclassified report

Descriptors: (*Sodium compounds, Chlorides),

(*Chlorides, Sodium compounds), Mechanical properties, Crystals, Tensile properties, Deformation, Crystal lattice defects, Grain boundaries, Fracture (Mechanics), Recrystallization, Ductility.

The tensile behavior of fully dense polycrystalline sodium chloride has been correlated with deformation mode at different temperatures. At low temperatures (i.e. < 150 C) there is little plasticity. Slip bands are straight and the strain discontinuity cannot be accommodated at the grain boundaries. Under these conditions brittle cleavage fracture originates from an intergranular source. Above 150 C the onset of wavy slip permits adjacent grains to conform and there is a marked increase in plasticity. Above 200 C deformation is accompanied by grain boundary sliding, polygonization and recrystallization and the specimens elongate for a truly ductile fracture. These observations are compared with recent observations on polycrystalline magnesium oxide. (Author)

AD-614 061 Div. 25, 15
CFSTI Prices: HC$2.00 MF$0.50

TRG, Inc., Melville, N. Y.
RESONANCES IN THE SPECTRAL ENERGY DENSITY OF THERMAL FIELDS AND SPONTANEOUS EMISSION,
by Stephen R. Barone. Mar 65, 35p
Scientific rept. no. SR-5
Contract AF19 604 8817, Proj. 4645, Task 464502
AFCRL 65-228

Unclassified report

Descriptors: (*Thermal radiation, Resonators), (*Resonance, Thermal radiation), Green's function, Correlation techniques, Field theory, Excitation, Statistical functions, Interferometers.

The two-point correlation functions for a thermal field in an arbitrary geometric environment are evaluated in terms of the spectral density of the classical electromagnetic Green's function for the configuration. The utility of this representation is demonstrated by a calculation of the electric and magnetic spectral energy densities in the vicinity of a plane mirror and in an infinite aperture Fabry-Perot interferometer. It is shown how the rate and character of spontaneous emission in an arbitrary geometric environment can be extracted from the spectral energy density for a thermal field in that environment. Spontaneous magnetic dipole transitions in the above two geometric configurations are discussed in detail. (Author)

AD-614 062 Div. 25, 15
CFSTI Prices: HC$2.00 MF$0.50

TRG, Inc., Melville, N. Y.
THEORY OF COHERENCE FOR THE QUANTIZED ELECTROMAGNETIC FIELD,
by Nicholas Solimene. Feb 65, 47p
Scientific rept. no. SR-4
Contract AF19 604 8817, Proj. 4645, Task 464502
AFCRL 65-227

Unclassified report

Descriptors: (*Field theory, Quantum mechanics), (*Electromagnetic fields, Quantum mechanics), Thermal radiation, Calculus of variations, Green's function, Operators (Mathematics).

A preliminary account of the quantum theory of coherence for electromagnetic radiation is presented using the method of Schwinger's variational action principle. The generating functional for the quantum expectation values of arbitrary products of field operators for the free electromagnetic field subject to any homogeneous boundary conditions is explicitly given in terms of the dyadic Green's function for the corresponding classical problem. Although thermal expectation values are generated directly by the process of functional differentiation in this formulation, it is possible to generate expectation values for any free field state by employing projection operations. In particular Glauber's coherent state expectation values may be obtained. Results for the radiation field coupled only to c-number sources may trivially be extracted from the free field formulation. (Author)

AD-614 063 Div. 25
CFSTI Prices: HC$2.00 MF$0.50

TRG, Inc., Melville, N. Y.
FABRY-PEROT RESONANCES AT SMALL FRESNEL NUMBERS,
by Stephen R. Barone and Morris C. Newstein.
Jan 65, 28p Scientific rept. no. SR-3
Contract AF19 604 8817, Proj. 4645, Task 464502
AFCRL 65-174

Unclassified report

See also AD-613 684.

Descriptors: (*Resonators, Interferometers), (*Interferometers, Resonators), Theory, Resonance, Optical equipment, Diffraction, Numerical analysis, Lasers, Phase shift, Power series.

A theory of Fabry-Perot resonances designed to be useful at small Fresnel numbers is given. This theory is applied to the case where the interferometer mirrors are of arbitrary curvature and have circular apertures. Asymptotic formulas are derived for the diffraction output and phase shifts in the limit of small Fresnel numbers. These formulas demonstrate the mode discrimination properties of the interferometers when operated in this regime. Numerical results are presented covering a wider range of Fresnel numbers. (Author)

AD-614 081 Div. 25, 10, 22, 30
CFSTI Prices: HC$1.00 MF$0.50

Stanford Research Inst., Menlo Park, Calif.
THERMAL DIFFUSIVITY OF AMMONIUM PERCHLORATE,
by W. A. Rosser, S. H. Inami, and H. Wise. 1964, 16p

Unclassified report

Supported by the Office of Naval Research, Dept. of the Navy.

Descriptors: (*Ammonium compounds, Perchlorates), (*Propellants, Thermal diffusion), (*Thermal diffusion, Measurement), Acrylic resins, Glass, Quartz, Sodium compounds, Chlorides, Thermal properties, Test methods, Porosity, Particle size, Temperature.

A method was developed to measure the thermal diffusivity of poorly conductive materials. The method is absolute and rapid, and requires only small samples; tests of materials with known thermal properties confirm its accuracy. The thermal diffusivity of compressed ammonium perchlorate powders was measured as a function of porosity, particle size, and temperature. (Author)

AD-614 082 Div. 25, 14, 17
CFSTI Prices: HC$3.00 MF$0.75

Manlabs, Inc., Cambridge, Mass.
ANALYTICAL STUDY OF THE THERMODYNAMIC

FACTORS CONTROLLING DIAMOND SYNTHESIS AND GROWTH AT HIGH PRESSURES AND TEMPERATURES.
Final rept. for 1 Dec 62-31 Jan 65,
by Edward T. Peters, Laurence Kaufman, and John J. Ryan. Feb 65, 64p
Contract AF19 628 2466, Proj. 5621, Task 562101
AFCRL 65-168

Unclassified report

Descriptors: (*Diamonds, Synthesis), (*Crystal growth, Diamonds), Nickel alloys, Manganese alloys, Carbon alloys, Graphite, Carbides, Eutectics, Phase studies, Thermodynamics, High-pressure research, High-temperature research, Resistance (Electrical), Metallography.

A method for predicting a priori the conditions for indirect diamond synthesis, i.e., synthesis via a metal 'catalyst' or solvent, was developed. The method is based upon thermodynamic calculation of the high pressure phase equilibria for a given metal-carbon system, in which the liquid phase is approximated as a regular solution, i.e., a linear dependence of the volume of liquid metal-carbon alloys with composition has been assumed. Calculations were carried out for the nickel-carbon and manganese-carbon phase equilibria, representing non-carbide forming and carbide forming systems (at 1 atmosphere pressure), respectively. For comparison to the calculations, the eutectic temperature of the nickel-carbon system was measured experimentally at 40 kb pressure by means of in situ electrical resistances vs. temperature measurements and post-mortem metallographic observations; the calculated and experimental values are in agreement. Comparison of the calculated nickel-carbon phase equilibria with the experimental diamond synthesis data of other workers indicates that the lower temperature-pressure limits for indirect diamond synthesis are controlled by the eutectic temperature at pressure and the diamond-graphite equilibrium line. (Author)

AD-614 088 Div. 25

Rocketdyne, Canoga Park, Calif.
THE ANHARMONICITY CORRECTION FOR POLYATOMIC MOLECULES. PART II. METHANE,
by E. C. Curtis. 1964, 16p
Contract AF49 638 1135
AFOSR 65-0568

Unclassified report

Pub. in Journal of Molecular Spectroscopy (U. S.) v14 n3 p292-307 Nov 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Methane, Molecular properties), (*Vibration, Methane), Deuterated compounds, Tritiated compounds, Polyatomic molecules, Harmonic oscillators, Corrections, Perturbation theory.

The anharmonic correction to the vibrational frequencies of methane and all of its deuterium and tritium substituted derivatives was computed using a method reported earlier. The harmonic force constants and anharmonicity parameters were determined by Jones and McDowell. To compare this method to the conventional Dennison method it was necessary to devise an arbitrary method of classifying vibrations. This is described and the fit is satisfactory in both cases. The vibrational frequencies are then calculated for the unmeasured unsymmetrically substituted derivatives of methane. (Author)

AD-614 091 Div. 25
CFSTI Prices: HC$2.00 MF$0.50

RIAS, Inc., Baltimore, Md.

PROPERTIES OF CONDUCTION ELECTRONS IN IONIC CRYSTALS.
Final rept. for 15 Jan 61-14 Jan 65,
by David Kahn. 14 Jan 65, 38p
Contract AF49 638 1017, Proj. 9763, Task 976302
AFSOR 65-0657

Unclassified report

Descriptors: (*Transport properties, Electrons), (*Crystals, Ions), (*Electrons, Crystals), Semiconductors, Alkali metal compounds, Halides, Conductivity, Excitation, Color centers, Crystallography, Photoconductivity, Space charges, Solid state physics.

Investigations in the properties of charge transport and charge interaction in the alkali halide crystals are presented. Studies were made of photoconductivity, space charge formation, photodiffusion, ionic charge diffusion, and electron interaction with the lattice ions of these materials. The alkali halide crystals may be considered as large band gap semiconductors.

AD-614 099 Div. 25, 8
CFSTI Prices: HC$1.00 MF$0.50

Microwave Lab., Stanford Univ., Calif.
MICROWAVE RESEARCH.
Quarterly status rept. no. 24, 1 Nov 64-31 Jan 65.
Apr 65, 14p Rept. no. ML-1316
Contract Nonr22548

Unclassified report

See also AD-608 506.

Descriptors: (*Microwave frequency, Scientific research), (*Acoustics, Amplifiers), (*Lasers, Scientific research), Piezoelectric crystals, Semiconductors, Optics, Electrons, Phonons, Solid state physics, Oscillation.

At the present time there are eight projects active under the contract: (1) Acoustic Wave Amplification Studies, (2) Optical Maser Research, (3) Interaction of Acoustic Waves and Light, (4) Tunable Lasers, (5) Electron-Phonon Interactions, (6) Geometrical Optics of Acoustic Waves, (7) Oscillations in Semiconductors, and (8) Solid State Plasma Studies.

AD-614 132 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Polytechnic Inst. of Brooklyn, N. Y.
ON LINEAR EQUATIONS OF ANISOTROPIC ELASTIC PLATES,
by Yi-Yuan Yu. Jan 64, 11p
Scientific rept. no. SR-1
Contract AF49 638 1290

Unclassified report

Descriptors: (*Elasticity, Sheets), (*Calculus of variations, Elasticity), Power series, Partial differential equations, Hamiltonian, Boundary value problems, Equations, Integration.

A generalized Hamilton's principle and the associated variational equation of motion for linear and anisotropic elastic plates are deduced from their counterpart in general elasticity theory through expansion of the displacement and strain in infinite power series in the manner of Cauchy and Mindlin, and by carrying out the integration in the thickness direction of the plate.

AD-614 136 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Maryland Univ., College Park.

FUNDAMENTAL PROBLEMS OF SOLIDS.
Final rept. for 1 Sep 61-31 Aug 64,
by Richard A. Ferrell and Ralph D. Myers.
31 Aug 64, 11p
Grant AF AFOSR62 46
AFOSR 65-0656

Unclassified report

Descriptors: (*Solid state physics, Theory), Superconductors, Electrons, Massbauer effect, Photons, Resonance, Correlation techniques, Solids.

The objective of the studies can be stated in broad terms as an attempt to achieve a deeper understanding of the fundamental problems of solids, namely the problem of electronic correlations and the correlations of lattice vibrations with electrons and other lattice vibrations. A central theme was the description of such correlations in terms of the collective motions of the system.

AD-614 137 Div. 25

Polytechnic Inst. of Brooklyn, N.Y. Dept. of Chemistry.
POLYMORPHISM OF RARE EARTH DISILICIDES,
by J. A. Perri, E. Banks, and B. Post. 15 Jun 59,
2p
Contract AF49 638 1193
AFOSR TN-60-204

Unclassified report

Pub. in Journal of Physical Chemistry v63 p2073-4 1959 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Silicides, Rare earth compounds), (*Crystal structure, Silicides), (*Phase studies, Silicides), X-ray diffraction analysis, Transition temperature, Crystal lattices.

The paper describes the results of an X-ray diffraction study of the ranges of stability of the two polymorphic forms of the disilicides of some rare earth metals. Reversible transformations have been observed; the temperatures of these transformations appear to be simply related to the atomic radii of the metals.

AD-614 142 Div. 25, 4

Notre Dame Univ., Ind.
THERMAL DESORPTION OF Sr FROM W,
by T. E. Madey, A. A. Petrauskas, and E. A. Coomes.
15 Sep 64, 8p
Contract Nonr162301, Proj. NR372 731

Unclassified report

Pub. in Journal of Chemical Physics (U. S.) v42, n2 p479-85 Jan 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Tungsten, Adsorption), (*Adsorption, Strontium), (*Strontium, Separation), Work functions, Heat of activation, Thermal properties, Thermionics emission, Metal films, Electron microscopy, Partial differential equations.

A study of the kinetics of the thermal desorption of Sr from W has been performed in which the field electron microscope was used to identify the state of adsorbate-substrate system. The activation energy for the thermal desorption of Sr from W falls from 4.21±0.22 eV/atom at zero Sr coverage to 1.78±0.13 eV/atom at 'monolayer' coverage. This latter value approaches the heat of sublimation of bulk Sr (1.69 eV/atom). The desorption energies found using field-emission techniques deviate markedly from the extrapolated thermionic results of Moore and Allison near theta=0 and for theta>0.5. A linear relationship was found to exist between the activation energy for desorption and the logarithm of the pre-exponential factor in the rate equation. (Author)

AD-614 149 Div. 25, 17

Massachusetts Inst. of Tech., Cambridge.
NEUTRON DIFFRACTION STUDIES OF THE ORDER OF THE ATOMS IN THE P PHASE AND THE R PHASE,
by Clara B. Shoemaker, David P. Shoemaker, and John Mellor. 6 Jan 64, 8p
AROD 3259:3

Unclassified report

Pub. in Acta Crystallographica (Denmark) v18 pt1 p37-44 Jan 1965 (Copies available only to DDC users).

Descriptors: (*Crystal lattices, Neutron defraction analysis), (*Neutron diffraction analysis, Crystal lattices), (*Molybdenum alloys, Neutron diffraction analysis), Nickel alloys, Chromium alloys, Iron alloys, Manganese alloys, Atoms, Phase studies, Solid solutions, Intermetallic compounds, Neutron scattering.

The ordering of the atoms in two ternary alloys, P phase (Mo-Ni-Cr) and R phase (Mo-Fe-Mn), both structurally related to the sigma phase, has been studied by powder neutron diffraction. The at.% Mo on each site was taken to be approximately that determined in previous X-ray single-crystal studies, which showed that Mo preferentially occupies CN16 and CN15 sites. From the best fit between observed and calculated neutron diffraction diagrams it is apparent that, in the P phase, Ni preferentially occupies CN12 positions. In the R phase, Mn shows only a slight preference for CN14 and CN15 positions over CN12 positions when competing with Fe. The results are consistent with those of ordering studies of related transition element intermetallic compounds. (Author)

AD-614 163 Div. 25

Bell Telephone Labs., Inc., Murray Hill, N. C.
HIGH-FIELD MAGNETORESISTANCE OF INHOMOGENEOUS SEMICONDUCTORS AND PLASMAS. III. TWO-DIMENSIONAL INHOMOGENEITY DISTRIBUTIONS,
by J. A. Morrison and H. L. Frisch. 24 Mar 64, 8p

Unclassified report

Pub. in Journal of Mathematical Physics (U. S.) v5 n12 p1681-7 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Semiconductors, Magnetic properties), (*Plasma medium, Magnetic properties), Tensor analysis, Magnetic fields, Series.

In previous papers studies were made of the high magnetic field magnetoresistance of a classical model semiconductor (or a plasma) produced by the presence in the sample of more or less random spatial inhomogeneities on a scale small compared to the size of the sample. Computations of the leading terms of the components of the resistivity tensor are extended to the two-dimensional case in which the external magnetic field is inclined (but not perpendicular) to the plane of variation of the spatial inhomogeneity distribution. The field is applied along the z axis, and the inhomogeneity distribution is characterized by a sufficiently smooth potential. While the magnetoresistance ratios saturate in the y and z directions, one finds that this ratio is proportional to the square of the field in the x direction. (Author)

AD-614 165 Div. 25

Queens Coll., Flushing, N. Y.
DISCUSSION OF THE WEAK AND STRONG PRINCIPLES OF EQUIVALENCE,
by A. L. Harvey. 27 Nov 64, 2p

Unclassified report

Pub. in Annals of Physics (U. S.) v31 n1 p240-1 Jan 1965 (Copies not available to DDC or Clearinghouse customers).
Supported in part by ONR.

Descriptors: (*Physics, Theory), Relativity theory, Mass - energy relation. Moment of inertia.

AD-614 166 Div. 25

North Carolina Univ., Chapel Hill.
FALLING CHARGES,
by Cecile Morette DeWitt and Bryce S. DeWitt.
28 Apr 64, 18p
Contract Nonr85507; Grant AF AFOSR153 63
AFOSR 65 0481

Unclassified report

Pub. in Physics v1 n1 p3-20 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Falling bodies, Charged particles), (*Charged particles, Field theory), (*Field theory, Charged particles), Differential geometry, Motion, Gravity, Relativity theory, Green's function, Integrals, Electric fields.

The radiative damping force on an electrically charged particle falling freely in a static weak gravitational field is computed in the nonrelativistic limit of small velocities. It is shown that, in this limit, the force separates naturally into two components, a conservative part which arises from the fact that the mass of the particle is not concentrated at a point but is partly distributed as electric field energy in the space surrounding the particle, and a nonconservative part which depends linearly on both the velocity and the Riemann tensor. The conservative force is shown to correspond to a repulsive inverse square potential and to make a retrograde contribution to the perihelion precession. The nonconservative part is shown to produce an average energy loss identical with that of the traditional formula which is used for accelerations caused by nongravitational forces. Because the nonconservative force depends on the velocity rather than its second derivative, however, the phenomenon of preacceleration does not occur with gravitational forces. The questions answered by this investigation are of conceptual interest only, since the forces involved are far too small to be detected experimentally. (Author)

AD-614 173 Div. 25, 20

Maryland Univ., College Park.
THREE-PARTICLE UNITARITY INTEGRAL,
by Y. S. Kim. 11 Mar 64, 5p
Grant AF AFOSR500 64
AFOSR 65-0502

Unclassified report

Pub. in Physical Review (U. S.) v135 n2B pB454-8 Jul 27 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*N-body problem Scattering), (*Integrals, N-body problem), Quantum mechanics, Resonance, Absorption, Nuclear particles, Special functions (Mathematical).

Various forms of the production amplitude are proposed which are convenient for the three-particle unitarity integral. Both exact and approximate forms are discussed. It is found that in both cases one can separate the final-state configuration from the over-all kinematics by using discrete variables. Form factors with the three-particle intermediate state are also discussed. (Author)

AD-614 177 Div. 25, 4

Rocketdyne, Canoga Park, Calif.
THE ANHARMONICITY CORRECTION FOR POLYATOMIC MOLECULES. PART I. METHODS AND APPLICATION TO CH2O,
by E. C. Curtis. 27 Mar 64, 13p
Contract AF49 638 1135
AFOSR 65-0569

Unclassified report

Pub. in Journal of Molecular Spectroscopy v14 n3 p279-91 Nov 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Molecular spectroscopy, Mathematical analysis), (*Polyatomic molecules, Spectra (Infrared)), (*Formaldehyde, Spectra (Infrared)), Chemical bonds, Vibration, Band spectrum, Dipole moments, Harmonic oscillators, Deuterated compounds.

A new approach is offered for computing anharmonicity factors for simple polyatomic molecules from the observed fundamental vibrational frequencies. This involves addition of terms for anharmonicity to a conventional normal coordinate analysis based on the amplitude of the normal vibrations. For an example, the method is applied to formaldehyde in several degrees of approximation, one of which was able to reproduce the observed frequencies within the experimental error. (Author)

AD-614 180 Div. 25, 4

Lincoln Lab., Mass. Inst. of Tech., Lexington.
ELECTROCHEMICAL DEMBER EFFECT IN SEMICONDUCTORS,
by W. W. Harvey and Mary C. Finn. 1964, 9p
Rept. no. JA-2390
Contract AF19 628 500

Unclassified report

Pub. in Surface Science v2 p456-63 1964
(Copies available only to DDC users).

Descriptors: (*Semiconductors, Electrochemistry), (*Electrochemistry, Semiconductors), Etched crystals, Germanium, Silicon, Indium alloys, Antimony alloys, Surface properties, Thermoelectricity.

It was demonstrated that during steady-state etching of a semiconductor with zero net current across the interface, there is a potential difference, superposed upon that of the space charge, between surface and interior whenever the reaction results in a net consumption or generation of carriers. It was possible to make rough measurements of this potential difference, which like the optically induced Dember effect is associated with gradients of excess carrier densities. Measured signals were of the correct order of magnitude and, for reactions known to be injecting, of the proper sign. In addition to etching reactions involving a net generation of carriers, examples were found of reactions which extracted carriers from the semiconductor as well as reactions in which the carriers apparently do not participate. (Author)

AD-614 184 Div. 25, 15

Imperial Coll. of Science and Tech., London (England).
ON MASSIVE AND MASSLESS PHOTONS,
by N. Dombey. 18 Dec 63, 11p
Grant AF AFOSR42 63
AFOSR 65-0479

Unclassified report

Pub. in Il Nuovo Cimento v32 (Ser10) p1696-1706 Jun 16 1964 (Copies available only to DDC users).

Descriptors: (*Photons, Field theory), (*Field theory, Photons), Perturbation theory, Relativity theory, Polarization, Operators (Mathematics), Identities.

The vanishing of the longitudinal mode of a massive photon as the photon mass goes to zero in gauge-invariant electrodynamics is investigated with the help of examples. A distinction between two forms of gauge-invariant amplitudes is made in order to clarify this limit; conditions are then obtained so that the limiting process is smooth. From these conditions results on the equality of particle charge which are usually derived by means of Ward's identity can be obtained. (Author)

AD-614 196 Div. 25

Marine Lab., Univ. of Miami, Coral Gables, Fla.
ANALYSIS OF SPREADING LOSS FOR REFRACTED/REFLECTED RAYS IN CONSTANT-VELOCITY-GRADIENT MEDIA,
by M. J. Jacobson. 11 Jun 64, 8p

Unclassified report

Pub. in Journal of the Acoustical Society of America v36 n12 p2298-2305 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sound transmission, Underwater), (*Acoustics, Underwater), Attenuation, Refraction, Reflection, Underwater sound, Mathematical analysis.

The analytical properties of existing spreading-loss formulas are not well-known in the case where a ray experiences multiple boundary reflections. This paper investigates spreading loss in detail for refracted/bottom-reflected rays when the velocity gradient is a negative constant and the bottom is horizontal. Expressions for the spreading loss are derived, special cases are examined, and upper bounds are obtained. It is shown that there are some points on every ray at which the spreading loss is less than inverse-square loss and some points on some rays at which the loss exceeds inverse-square loss. The loss behavior is examined as a ray path is traversed, and is found to be markedly dependent upon initial ray inclination, the ray lobe being considered, and velocity structure. The problem of multiple arrivals at a fixed receiver is also studied. Relationships are given between the number of arrivals and their intensity, travel time, initial inclination, and number of reflections. Two examples are presented. The results in this paper apply not only to refracted/bottom-reflected transmissions, but also to surface-channel and deep-sound-channel transmissions. (Author)

AD-614 197 Div. 25, 4

Coates Chemical Labs., Louisiana State Univ., Baton Rouge.
PHOTOCONDUCTIVITY OF ANTHRACENE,
by R. Raman, L. Azarraga, and S. P. McGlynn.
4 May 64, 9p
Grant DA ARO D31 124G524.
AROD 4706:1

Unclassified report

Pub. in Journal of Chemical Physics v41 n8 p2516-23 Oct 15, 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Photoconductivity, Aromatic compounds), Hydrocarbons, Polycyclic compounds, Crystals, Integrated circuits, Pulse integrators, Electric fields, Quantum mechanics, Graphics, Voltage, Electromagnetic pulses.

The transport properties of current carriers in anthracene have been studied by a crystal counter technique. It has been shown that the charge pulses may be analyzed as the sum of two contributions, a primary component which varies linearly with time and which breaks at a time equal to the transit time, and a secondary component which is caused by slow release of holes from traps in the surface region. Analysis of both components leads to carrier mobilities, thermal dependence of carrier mobilities and of carrier populations, surface trap depths, etc. The interpretation of pulse height vs voltage behavior which is superlinear invokes recombination and/or detrapping processes which are field-dependent. Experiments are presented which show that recombination at the surface is kinetically more important than recombination in the bulk. It is indicated that the photogeneration of charge carriers at the irradiated surface may be biphotonic. (Author)

AD-614 200 Div. 25

British Columbia Univ., (Vancouver).
THE EFFECT OF STRAIN ON THE EXCITON SPECTRUM OF GERMANIUM,
by A. M. Glass. 27 Jul 64, 17p
Grant DRB9510 35

Unclassified report

Pub. in Canadian Journal of Physics v43 p12-27 Jan 1965(Copies available only to DDC users).

Descriptors: (*Germanium, Absorption spectrum), (*Strain (Mechanics), Crystal lattices), (*Crystal lattices, Deformation), (*Absorption spectrum, Strain (Mechanics)), Cryogenics, Band spectrum, Excitation, Semiconductors, Electron transitions, Shear stresses, Compressive properties, Tensile properties, Crystal lattice defects.

The intensity of optical absorption, near the absorption edge in germanium, is examined as a function of strain applied to the lattice at 90K. The results are interpreted in terms of the change of the band structure of the lattice with applied strain. The absorption edge in unstrained germanium shows a single sharp peak due to direct-transition exciton formation at k= 0, whereas the edge in the strained specimens shows two exciton peaks. The peak positions vary linearly with both compressional and tensional strain up to the maximum strains applied (0.1% deformation). The exciton binding energies in the strained germanium lattice, calculated within the effective mass approximation, are approximately equal and independent of the magnitude of the strain. The separation of the peaks gives for the shear deformation potentials the values b = (2.7 ± 0.3) eV/unit (100) shear and d = (4.7 ± 0.5) eV/unit (111) shear. The positions of the peaks give the shift of the energy gap as -(10.3 ± 1) eV/unit dilation. Lattice imperfections are found to have no effect on the interpretation of the results. (Author)

AD-614 206 Div. 25, 15

Rome Univ. (Italy).
ASYMPTOTIC BEHAVIOR FOR LARGE IMAGINARY VALUES OF ANGULAR MOMENTUM OF THE AMPLITUDES FOR THE SCATTERING OF A DIRAC PARTICLE ON A CENTRAL SCALAR POTENTIAL,
by F. Calogero and J. M. Charap. 10 Dec 63, 20p

Grant AF AFOSR42 63
AFOSR 65-0478

Unclassified report

Pub. in Il Nuovo Cimento v32 ser 10 p1665-84 1964
(Copies available only to DDC users).
Prepared in cooperation with Imperial Coll. (England)

Descriptors: (*Particles, Scattering), (*Potential theory, Scattering), Operators (Mathematics), Momentum, Complex numbers, Integral equations, Bessel functions, Tensor analysis.

It is proved that the analytically continued partial-wave amplitudes for the scattering of a Dirac particle on a central sealar potential which may be expressed as a superposition of Yukawa functions vanishes as the imaginary part of the angular momentum increases without bound. The potential has to be further restricted so that it vanishes at small distances and is weak. The method of proof is based on the phase approach to scattering theory. (Author)

AD-614 208 Div. 25, 8

Army Electronics Labs., Fort Monmouth, N. J.
RESONANT FREQUENCY MIXING EFFECTS IN DISTRIBUTED MEDIA.
Reprint,
by H. G. Andresen, H. Welling, and K. D. Moller. 1962, 6p

Unclassified report

(Copies available only to DDC users).

Descriptors: (*Elementary particles, Resonance), (*Microwave equipment, Quantum mechanics), Excitation, Nonlinear systems, Harmonic oscillators, Frequency, Atomic energy levels, Pumping(Electronics), Cavity resonators, Waveguides, Electron transitions, Dipole moments.

The paper discusses some experimental conditions which must be fulfilled to optimize the resulting power conversion efficiency for resonant frequency mixing experiments. (Author)

AD-614 209 Div. 25

Army Electronics Labs., Fort Monmouth, N. J.
CRITERIA FOR OPTICAL MASER AMPLIFIERS AND OSCILLATORS.
Reprint,
by J. Jacobs, D. Holmes, L. Hatkin, and F. A. Brand. 1961, 7p

Unclassified report

(Copies available only to DDC users).

Descriptors: (*Lasers, Ruby), (*Amplifiers, Lasers), (*Oscillators, Lasers), Light transmission, Reflection, Gain, Phase shift, Mathematical models, Optics.

The purpose of this report is to determine the output intensity for the case of multiple internal reflections in a ruby medium with a negative attenuation factor. In addition, it is desirable to be able to describe the phase of the output wave with respect to the input. Finally, the criteria for oscillations will be given. To do this an equivalent circuit for the laser amplifier will be formulated.

AD-614 216 Div. 25

Westinghouse Research Labs., Pittsburgh, Pa.
MAGNETIC AND ELECTRICAL ANOMALIES IN LaCoO3,
by R. R. Heikes, R. C. Miller, and R. Mazelsky.
11 Jan 64, 9p
Contract AF49 638 1245

Unclassified report

Pub. in Physica (Netherlands) v30 p1600-8 1964
(Copies available only to DDC users).

Descriptors: (*Magnetic properties, Colbalt compounds), (*Electrical properties, Cobalt compounds), (*Cobalt compounds, Anomalies), Oxygen compounds, Lanthanum compounds, Thermal conductivity, Thermoelectricity, Magnetic moments, Excitation, Atomic energy levels, Spin, Electrical conductance, Graphics, Resistance (Electrical), Temperature.

The electrical conductivity and Seebeck coefficient of LaCoO3 drops rapidly with increasing temperature in the vicinity of 500K. The magnetic moment per cobalt atom also changes by about one Bohr magneton in the same temperature range. These results have been explained by a model in which an electron is thermally excited from one 3d level to another with an accompanying change in spin, and in which the difference in energy of the two levels decreases with increasing population of the upper level because of electrostatic interaction. (Author)

AD-614 219 Div. 25, 15

Oslo Univ. (Norway).
ON THE CONCEPTION OF GENERALIZED SPIN OF FREE DIRAC PARTICLES,
by Egil A. Hylleraas. Jun 64, 11p
Institute rept. no. 22
Contract AF61 052 134
AFOSR 65-0453

Unclassified report

Pub. in Physica Mathematica (Norway) p1-11 Jun 1964
(Copies available only to DDC users).
Research supported in part by Fridtjof Nansen's Fund for Advancement of Science.

Descriptors: (*Spin, Particles), (*Quantum mechanics, Spin), Tensor analysis, Electrons, Hamiltonian, Operators (Mathematics), Elementary particles, Transformations (Mathematics), S-matrix, Norway.

AD-614 220 Div. 25, 15

Oslo Univ. (Norway).
THE GENERAL ORTHOGONALITY THEOREM IN THE HYLLERAAS-SCHERR-KNIGHT VARIATIONAL PERTURBATION METHOD,
by John Midtdal. Nov 64, 10p
Institute rept. no. 25
Contract AF61 052 134
AFOSR 65-0454

Unclassified report

Pub. in Physica Mathematica (Norway) p1-10 Nov 1964 (Copies available only to DDC users).
Research supported in part by Fridthof Nansen's Fund for Advancement of Science.

Descriptors: (*Perturbation theory, Quantum mechanics), Calculus of variations, Theorems.

AD-614 225 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

George Washington Univ., Washington, D. C.
School of Engineering and Applied Science.
STUDIES IN THE THEORY OF A DISLOCATED CONTINUUM.
Final scientific rept.,
by G. M. Arkilic. Jun 64, 19p
Grant AF AFOSR224 63

Unclassified report

Descriptors: (*Continuum mechanics, Theory), (*Differential geometry, Continuum mechanics), Torque, Tensor analysis, Crystal lattice defects.

In this report, by using curvilinear and anhalonomic coordinate systems, the most general forms of linear coefficients of connexions, and expressions for torsion and curvature are represented. These are the basic quantities that relate non-Riemannian spaces of differential geometry to the theory of dislocated continuum. By these special choice of coordinates, it was possible to obtain some quantities which could not have been retained in less general systems. However, in order to see physical significance and to check the validity of these equations time to time special cases are introduced. The significance of this approach is expected to be more pronounced as investigations are extended into the fields of stresses and displacements. (Author)

AD-614 232 Div. 25, 2, 15
CFSTI Prices: HC$2.00 MF$0.50

Lincoln Lab., Mass. Inst. of Tech., Lexington.
EFFECTS OF GENERAL RELATIVITY ON INTERPLANETARY TIME-DELAY MEASUREMENTS,
by I. I. Shapiro. 18 Dec 64, 31p
Technical rept. no. TR-368
Contract AF19 628 500
ESD TDR-64-590

Unclassified report

Descriptors: (*Relativity theory, Radio astronomy), (*Radio astronomy, Relativity theory), Planets, Venus, Mercury (Planets), Gravity, Solar corona, Time, Integrals, Tensor analysis.

The predictions of general relativity regarding interplanetary time-delay measurements are explored in detail. We conclude that a fourth test of the theory is now feasible since the modifications of general relativity introduce on extra delay of about 200 micro sec when radar waves are reflected from either Mercury or Venus near superior conjunction. The uses of such measurements to investigate the solar corona, a possible time dependence of the gravitational constant, and the precession of Mercury's perihelion are also discussed. (Author)

AD-614 234 Div. 25, 4
CFSTI Prices: HC$1.00 MF$0.50

Weizmann Inst. of Science, Rehovoth (Israel).
RESEARCH ON MEASUREMENT OF PRESSURE INDUCED SHIFTS OF ABSORPTION LINES IN THE INFRARED SPECTRUM.
Final rept. for 1 Apr 60-31 Dec 64.
Feb 65, 8p
Contract AF61 052 388
AFCRL 65-224

Unclassified report

Descriptors: (*Infrared spectroscopy, Line spectrum), (*Line spectrum, Pressure), Gases, Absorption spectrum, Reviews, Bibliographies, Israel.

The main body of the report consists of abstracts of the thirteen Technical (Scientific) Notes submitted between April 1 1960 and December 31 1964. It also lists the personnel who worked under the contract. (Author)

AD-614 235 Div. 25, 8
CFSTI Prices: HC$5.00 MF$1.25

Microwave Lab., Stanford Univ., Calif.
SATURATION PHENOMENA IN Zn2Y FERRITE AT FREQUENCIES BELOW RESONANCE,
by R. E. Tokheim. Feb 65, 182p
Scientific rept. no. SR-4, ML-1290
Contract AF19 628 342, Proj. 4600, Task 460003
AFCRL 65-138

Unclassified report

See also AD-410 988.

Descriptors: (*Ferromagnetic materials, Pumping (Electronics)), (*Ferrites, Magnetic moments), Zinc compounds, Yttrium compounds, Magnetic properties, Ferromagnetism, Phonons, Nuclear magnetic resonance, Partial differential equations.

An experimental and theoretical investigation was made of transverse pumping saturation effects in Zn2Y ferrite at frequencies far below ferromagnetic resonance. Chief interest was in saturation effects at frequencies below the bottom of the spin.wave manifold, where the lowest order phonon instabilities were expected to compete favorably with the higher order spin wave instabilities. Measurements of saturation effects in single crystal Zn2Y , with the easy plane lying in the plane of the disk, were made at 1.32 kMc. The dc and rf magnetic fields were applied orthogonally in the plane of the disk. The large rf magnetic fields required were obtained by employing a strontium titanate dielectric resonator. In these experiments the order of the first resonant spin wave instability permitted was varied from the first to the fifth by adjusting the position of the spin wave manifold relative to the pump frequency. The nature of the saturation was investigated by observing the waveform of the reflected pump pulse. Theoretical on-resonance spin wave thresholds up to fourth order and off-resonance spin wave thresholds up to second order were derived. (Author)

AD-614 254 Div. 25
CFSTI Prices: HC$3.00 MF$0.75

Cornell Univ., Ithaca, N. Y.
GROUND STATE OF AN ELECTRON GAS IN A MAGNETIC FIELD,
by V. Celli and N. David Mermin. Apr 65, 62p
Technical rept. no. TR-4
Contract Nonr40138

Unclassified report

Descriptors: (*Semiconductors, Atomic energy levels), (*Electrons, Magnetic fields), Nuclear spins, Field theory, Transition temperatures, Indium alloys, Antimony alloys.

The ground state of an electron gas in a uniform magnetic field is found to be not the customary uniform state, but rather one in which a spin density wave exists, directed along the field. This conclusion is reached through what is essentially a Hartree-Fock calculation with a repulsive interaction, but in which no restrictive assumptions are made about either the strength or the range of the exchange interaction. Thus static screening does not eliminate the spin density wave in the presence of a magnetic field, as it does in the electron gas when no magnetic field is present. The temperature at which

the transition to a spin density wave state occurs approaches zero as the field vanishes. The pertinent question is therefore not the nature of the ground state, but whether there is a range of field strengths and electronic densities for which the transition temperature is observably high. It is found that spin density wave formation is most favorable when only a few Landau levels are occupied, corresponding to large field strengths and low electronic densities. A rough calculation indicates that in InSb a transition temperature as high as 10 millidegrees can be realized. (Author)

AD-614 264 Div. 25, 13
CFSTI Prices: HC$3.00 MF$0.75

Ordnance Research Lab., Pennsylvania State Univ., University Park.
FLEXURAL-WAVE-TRANSMISSION PROPERTIES OF PLATE-JOINT AND ROD-JOINT SYSTEMS,
by D. S. Pallett. 31 Mar 65, 54p
Contract NOw65 0123d3

Unclassified report

Descriptors: (*Joints, Vibration), Metal plates, Rods, Attenuation, Boundary value problems, Partial differential equations, Theory, Rotation, Motion.

The report presents the results of a theoretical and experimental study of the flexural-wave-transmission properties of plate joints and rod joints. A discussion of the theory of possible wave-transmitting mechanisms illustrates the complexity of the problem. Finite clamping length is included in a theoretical analysis of the transmission properties of rod joints. Solutions are presented for the transmitted, reflected, and near-field amplitude terms in dimensionless parameters that refer to the physical characteristics of the joint. It is shown that, at low frequencies, joint rotation is the dominant mechanism of transmission; whereas, at the higher frequencies, centroid displacement dominates. Qualitative experimental agreement for this theory is included. (Author)

AD-614 283 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Technische Hochschule, Hanover (Germany).
THE ADIABATIC LINEAR STARK EFFECT IN A PLASMA,
by K. H. Wilke, K. Hunger, and R. W. Larenz.
1 Dec 64, 17p Technical note no. TN-3
Contract AF61 052 161
AFCRL 65-192

Unclassified report

Descriptors: (*Electrostatics, Plasma medium), (*Plasma physics, Electrostatics), Electric fields, Hydrogen, Atomic energy levels, Quantum mechanics, Spectroscopy.

The electrical microfield in a plasma changes rapidly in space and time. For this reason the linear Stark effect of hydrogen spectral lines emitted from a plasma cannot be treated by a pure static theory as this is usually done assuming that the shift of atomic energy levels corresponds to the instantaneous electric field. A more rigorous treatment has to consider the simultaneous action of the long range Coulomb fields of many particles. Only the low frequency part of this composed field leads to adiabatic energy shifts. On obtaining an expression for the mean square low frequency field some Balmer line profiles are computed as far as the adiabatic Stark effect is concerned. On account of some new results on the probability distribution of the microfield a Gaussian distribution has to be used for the adiabatic shift of a single energy term. The resulting profiles are compared with those of the static 'Holtsmark-Theory' and some experimental material. It turns out that the formula obtained here for adiabatic line broadening coincides nearly with the 'Lindholm Formula' for the Coulomb case but derived originally to account for collision broadening. (Author)

AD-614 289 Div. 25, 4

Institute for the Study of Metals, Univ. of Chicago, Ill.
GUEST-HOST INTERACTIONS: AN EXAMINATION OF THE SOLVENT-INDUCED SPECTRAL SHIFT IN A MODEL SYSTEM,
by Huei-Ying Sun, Stuart A. Rice, and Joshua Jortner.
30 Mar 64, 8p
Grant AF AFOSR369 63, Proj. 9760, Task 976001
AFOSR 65-0539

Unclassified report

Pub. in Journal of Chemical Physics, v41 n12 p3779-86 Dec 15 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hydrogen, Electron transitions), (*Electron transitions, Line spectrum), (*Helium, Crystal lattices), Field theory, Impurities, Excitation, Molecular association, Atomic energy levels, Solvent action.

A study was made of the effect of a surrounding lattice of He atoms on the manifold of electronic states of the H2(+) molecule-ion. One-center expansions of the molecular wavefunctions are employed, calculated by the Tibbs-Wannier method. The spherically averaged wavefunctions are in good agreement with the known exact solutions. A detailed study of the environmental effect of the He lattice leads to the prediction of a blue shift of the first electronic transition, arising from a delicate balance between changes in the impurity excitation energy, Coulomb, exchange, van der Waals, and three-center interaction terms. The signs of the various energy changes are rationalized in terms of the overlap charge density. These results are compared with previous treatments of environmental spectral shifts based on continuum models. (Author)

AD-614 292 Div. 25, 4

Lincoln Lab., Mass. Inst. of Tech., Lexington.
PARTIAL PRESSURES AND GIBBS FREE ENERGY OF FORMATION FOR CONGRUENTLY SUBLIMING CdTe(c),
by R. F. Brebrick and A. J. Strauss. 17 Jun 64, 7p Rept. no. JA-2383
Contract AF19 628 500

Unclassified report

Pub. in Journal of Physics and Chemistry of Solids v25 p1441-5 1964 (Copies available only to DDC users).

Descriptors: (*Intermetallic compounds, Sublimation), (*Sublimation, Intermetallic compounds), (*Cadmium alloys, Tellurium alloys), (*Tellurium alloys, Cadmium alloys), Vapor pressure, Thermodynamics, Solids, Optical analysis, Scientific research, Spectrophotometers, Solid state physics.

The partial pressures of Cd(g) and Te2(g) over congruently subliming CdTe(c) between 780 and 939C were determined by measuring the optical density of the coexisting vapor at 2287, 3650, 4357 and 5000 A. It is found that p(Cd) = 2P(Te2) and log p(Te2)(atm) = - (10000)/T + 6.346. The standard Gibbs free energy of formation of Cd sub (1 - x) Te sub x(c) from Cd(g) and Te2(g) is delta G (CdTe(c)) = - 68.64 + 44.94 (0.001)T kcal/mole,

independent of composition. This expression agrees quite well with those which represent the data obtained in electro-chemical and effusion experiments at lower temperatures, although the equilibrium state studied in the present investigation is different from the steady state attained in effusion experiments. (Author)

AD-614 294 Div. 25, 9

Aeronautical Research Associates of Princeton, Inc., N. J.
COLLISIONS OF THREE HARD SPHERES,
by Guido Sandri, Roger D. Sullivan, and Philip Norem. 16 Nov 64, 4p
Contract AF49 638 1224
AFOSR 65-0554

Unclassified report

Pub. in Physical Review Letters v13 n25 p743-5 Dec 21 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Molecules, Transport theory), (*Transport theory, Molecules), N-Body problem, Perturbation theory, Vector analysis.

Reference is made to the phase-space domain lambda-4 and to the demonstration that it is nonempty (G. Sandri, Ann. Phys. (N.Y.) 24:332,380 (1963) and Nuovo Cimento 31:1131 (1964)). Such phase-space domains correspond to the occurrence of successive binary collisions in the analysis of the orbiting of 3 identical, classical, rigid, classical spheres in otherwise empty flat Euclidean 3-dimensional space. In this paper, the form of lambda-4 is stated and precisely illustrated. Lambda-5 is proven empty. The necessary and sufficient conditions for the occurrence of 4 collisions are established, and 5 collisions are proved impossible.

AD-614 296 Div. 25

Massachusetts Inst. of Tech., Cambridge, Mass. Dept. of Metallurgy.
INFLUENCE OF CONTROLLED ADDITIONS OF OXYGEN ON THE SUPERCONDUCTIVITY OF NIOBIUM,
by C. S. Tedmon, Jr., R. M. Rose, and J. Wulff. 28 May 64, 4p
Grant DA ARO D31 124G236

Unclassified report

Pub. in Journal of Applied Physics (U. S.) v36 n1 p164-7 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Superconductivity, Niobium), (*Niobium, Superconductivity), (*Oxygen, Solid state physics), Single crystals, Magnetic fields, Electric currents, Density, Nucleation, Crystal lattice defects, Crystal substructure, Impurities.

The critical current density vs applied transverse magnetic field was measured, for a superconducting niobium single crystal of controlled oxygen content, at successively higher levels of concentration; the oxygen content was increased in increments ranging from 2 to 50 ppm, under conditions of constant substructure, from an initial level of approximately 5 ppm to a final level of 360 ppm. The over-all critical current density increased considerably on the addition of oxygen, and assuming gamma to be independent of oxygen concentration, the upper critical field increases in accordance with the predictions of the GLAG theory for type II superconductivity. The critical current density above the upper critical field, which has been ascribed to nucleation effects at defects or surfaces, was also very sensitive to the oxygen content. (Author)

AD-614 308 Div. 25, 17

Lincoln Lab., Mass. Inst. of Tech., Lexington.
ELASTIC CONSTANTS OF HgTe,
by J. G. Mavroides and D. F. Kolesar. 12 Oct 64, 3p Rept. no. JA-2452
Contract AF19 628 500

Unclassified report

Pub. in Solid State Communications v2 p363-4 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Single crystals, Elasticity), (*Mercury alloys, Tellurium alloys), (*Tellurium alloys, Mercury alloys), (*Elasticity, Single crystals), Test methods, Ultrasonic radiation, Solid state physics.

Using the ultrasonic pulse technique, the room temperature elastic constants of HgTe were found to be, in units of 10 to the 11 power dynes/sq cm: C sub 11 = 5.08, C sub 12 = 3.58, and C sub 44 = 2.05. From these values, a fundamental lattice absorption frequency = 1.87 x 10 to the 13th power and a Debye characteristic temperature at absolute zero, = 105K have been calculated. (Author)

AD-614 309 Div. 25

Lincoln Lab., Mass. Inst. of Tech., Lexington.
SIMPLE CONSTRUCTION FOR DETERMINING THE PHASE CHANGE OF LIGHT REFLECTED AT NORMAL INCIDENCE,
by G. B. Wright. 12 Nov 64, 1p Rept. no. JA-2475
Contract AF19 628 500

Unclassified report

Pub. in Applied Optics v4 n3 p366 Mar 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Phase shift, Electromagnetic wave reflections), (*Electromagnetic wave reflections, Phase shift), (*Light, Reflection), Scientific research, Optical properties, Solids, Determination.

AD-614 312 Div. 25

Lincoln Lab., Mass. Inst. of Tech., Lexington.
OBSERVATION OF INTERBAND TRANSITIONS IN ANTIMONY,
by Mildred S. Dresselhaus and John G. Mavroides. 6 Jan 65, 2p Rept. no. JA-2506
Contract AF19 628 500

Unclassified report

Pub. in Physical Review Letters v14 n8 p259-60 Feb 22 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electron transitions, Antimony), (*Antimony, Electron transitions), Atomic energy levels, Brillouin zones, Single crystals, Magnetic fields, Solid state physics, Band spectrum.

Evidence is presented for the existence of energy bands lying close to the Fermi surface, and exhibiting effective masses lower than those previously reported for bands at the Fermi surface.

AD-614 319 Div. 25, 17

Lincoln Lab., Mass. Inst. of Tech., Lexington.
MAGNETIC PROPERTIES OF V(3+) IONS IN CUBIC SPINELS,

Reprint,
by K. Dwight, N. Menyuk, D. B. Rogers, and A. Wold.
1964, 4p Rept. no. MS-1009
Contract AF19 628 500

Unclassified report

Descriptors: (*Vanadium compounds, Magnetic properties), (*Spinels, Vanadium compounds), Manganese compounds, Cobalt compounds, Oxides, Ions, Vanadium, Neutron diffraction analysis, Magnetic moments.

The magnetic properties of the normal cubic spinels MnV_2O_4 and CoV_2O_4 are investigated by neutron diffraction techniques. The magnetic diffraction pattern obtained from MnV_2O_4 suggests a Yafet-Kittel canting of the ionic moments, which are found to have the values of 4.5 microns sub beta and 1.2 microns sub beta for the manganese and vanadium ions, respectively. These results are in reasonable agreement with Plumier's findings. The diffraction pattern from CoV_2O_4 suggests a Neel configuration with moments of 2.9 microns sub beta and 0.8 microns sub beta for the cobalt and vanadium ions, respectively. However, indications of a high-field magnetic susceptibility require that alternative models be considered. It is shown that reasonable agreement with our data can be obtained on the basis of at least two special arrangements of canted moments. By virtue of recent theoretical developments, these experimental results show that neither MnV_2O_4 nor CoV_2O_4 can be adequately described by the nearest-neighbour Heisenberg approximation. This effect is attributed to the importance of orbital degeneracy and spin-orbit coupling in connection with the V(3+) ions. Some other consequences of these additional factors are considered. (Author)

AD-614 320 Div. 25, 17

Lincoln Lab., Mass. Inst. of Tech., Lexington.
ELECTRICAL AND ELECTRO-OPTICAL PROPERTIES OF INTERFACE-ALLOY HETEROJUNCTIONS,
by R. H. Rediker, S. Stopek, and E. D. Hinkley.
1965, 5p Rept. no. MS-1131
Contract AF19 628 500

Unclassified report

Pub. in Transactions of the Metallurgical Society of AIME v233 p463-7 Mar 1965
(Copies not available to DDC or Clearinghouse customers.)

Descriptors: (*Composite materials, Semiconductors), (*Semiconductors, Composite materials), (*Solid state physics, Composite materials), (*Surface properties, Semiconductors), Recrystallization, Electrical properties, Gallium alloys, Arsenic alloys, Indium alloys, Electron optics, Electron transitions, Atomic energy levels, Diodes (Semiconductor), Photons, Tunneling (Electronics), Photoelectric effect.

The electrical and electro-optical properties of such single-crystal heterojunctions between GaAs and GaSb and between p-type InAs and n-type GaSb were investigated. The forward current varies as exp (AV), where A is substantially independent of temperature. For GaAs-GaSb heterojunctions at temperatures above 370K, if the current -voltage relationship were to be expressed as exp (qV/nkT), then n would be less than unity. The injection luminescence associated with forward current is, for the most part, characteristic of the lower bandgap semiconductor. The photovoltaic effect measured for incident photons having energies in the range between the bandgaps of the two semiconductors is much smaller than that produced by higher-energy photons. (Author)

AD-614 324 Div. 25, 4

California Univ., Santa Barbara.
LASER POSSIBILITIES OF CHEMICALLY EXCITED MOLECULES FORMED WITH ATOMIC SPECIES,
by T. T. Kikuchi and H. P. Broida. 1965, 8p
Technical rept. no. TR-6
Contract Nonr422201, ARPA Order 125

Unclassified report

Pub. in Applied Optics Supplement 2 of Chemical Lasers p171-8 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Lasers, Molecular properties), (*Cyanogen, Lasers), Chemical reactions, Excitation, Atomic energy levels, Nitrogen, Flames, Vibration, Rotation.

The factors influencing laser oscillation by the decay of excited molecules formed by a chemical reaction are analyzed. The molecular system consists of three electronic levels, X, A, and B, listed in order of increasing excitation, of which the A level is preferentially populated by chemical reaction. Each of these states has its associated vibration-rotational levels. Effects of collision and rotational perturbation on depleting and on populating these levels are included in the analysis, which consists of solving the set of rate equations describing the growth of the various A and B states in conjunction with the condition for lasing. Electronically excited $CN_2(CN^*)$, produced by an atomic nitrogen flame reaction is considered as an example. A possibility exists for lasing of CN* at infrared and red wavelengths provided that the reaction is kept at low temperatures (about 77K). Even, then, it is necessary that the lower vibrational levels of the ground electronic state approach thermal equilibrium as soon as they are formed. A number of possible schemes for depleting the vibrational levels of the X states are discussed. (Author)

AD-614 325 Div. 25, 4

California Univ., Santa Barbara.
INVERTED POPULATION DISTRIBUTIONS PRODUCED BY CHEMICAL REACTIONS,
by H. P. Broida. 1965, 4p Technical rept. no. TR-7
Contract Nonr422201, ARPA Order 125

Unclassified report

Pub. in Applied Optics Supplement 2 of Chemical Lasers p105-8 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Lasers, Molecular properties), Atomic energy levels, Electron transitions, Gases, Flames, Chemical reactions, Cyanogen, Nitrogen, Oxygen, Halogenated hydrocarbons, Chloroform, Vibration, Rotation.

Although there are many possibilities of forming inverted populations by chemical reactions, few studies of actual inversions have been reported. The known examples are gas phase reactions, and generally the inversions are most pronounced at low pressures and involve reactions with atomic species. (Author)

AD-614 326 Div. 25

Missouri Univ., Columbia.
PHOTOELECTRIC EMISSION FROM BARIUM OXIDE,
by James E. Dueker and Eugene B. Hensley. 4 May 64, 6p Technical rept. no. TR-29
Contract Nonr229601, Proj. NR372 081 Unclassified report

Pub. in Physical Review v136 n1A pA190-4 Oct 5 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Barium compounds, Oxides), (*Photoelectric effect, Barium compounds), Excitation, Electron transitions, Atomic energy levels, Luminescence, Monochromatic light, Cathode (Electron tubes), Electron accelerators.

The photoelectric emission from barium oxide has been investigated by measuring the total photoelectric yield and the distributions in kinetic energy of the emitted electrons using an improved magnetic velocity-analyzer tube. The energy distribution measurements revealed four 'fast-peaks' which are interpreted as being associated with direct transition from energy levels located approximately 1.0, 1.4, 2.0 and 2.6 eV below the vacuum level. Confirmation of these transitions was obtained from plots of the spectral distribution of the total photoelectric yield. A 'slow peak' was observed in the energy distributions at about 0.5 eV which is attributed to exciton-induced photoelectric emission. Evidence is presented indicating that this is a true peak and not the truncated tail of a distribution which peaks at still lower energies. Possible identifications of the energy levels involved in the direct transitions and the energy loss mechanism involved in the exciton-induced transitions are discussed. (Author)

AD-614 328 Div. 25

Army Electronics Labs., Fort Monmouth, N. J.
DETERMINATION OF RADIAL DISTRIBUTION OF VOLUME RADIANCE OF A LUMINOUS MEDIUM CONFINED IN A GLASS CYLINDER,
by Rudolf G. Buser and Johann J. Kainz. 28 May 64, 4p
Unclassified report

Pub. in Journal of the Optical Society of America v55 n1 p12-5 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Luminescence, Spectroscopy), (*Spectroscopy, Luminescence), Glow discharges, Intensity, Plasma medium, Glass, Cylindrical bodies, Electron density, Temperature, Probes (Electromagnetic), Optics.

Experimental problems in connection with the measurement of the correct radial distribution of volume radiance of luminous media contained in a glass cylinder are discussed and the magnitude of the profile correction necessitated by the presence of the glass wall is determined for a particular case. (Author)

AD-614 351 Div. 25

Queens Coll., Flushing, N. Y.
ON THE SCALAR THEORY OF GRAVITATION,
by A. L. Harvey. 1964, 1p
Unclassified report

Pub. in American Journal of Physics (U. S.) v33 n2 p162-3 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Gravity, Theory), Relativity theory, Tensor analysis.

AD-614 357 Div. 25

Eaton Electronics Research Lab., McGill Univ., Montreal (Quebec).
CALCULATION OF CRYSTAL-FIELD ENERGY-LEVEL SPLITTINGS OF THE Ti(3+) ION IN RbA1(SO4)2.12H20,
by Gerald F. Dionne. 31 Aug 64, 6p
Grant DRB9512 20
Unclassified report

Pub. in Physical Review v137 n3A pA743-8 Feb 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Crystals, Field theory), (*Titanium, Crystals), Ions, Rubidium compounds, Aluminum compounds, Sulfates, Perturbation theory, Crystal structure, Groups (Mathematics), Quantum mechanics, Symmetry (Crystallography), Hamiltonian, Paramagnetic resonance, Atomic energy levels, Distortion.

By considering a crystal-field model of D2h point-group symmetry, the Stark energy-level separations of the Ti(3+) ion in RbA1(SO4)2.12H2O have been calculated. Previously reported results of EPR experiments have revealed the existence of an orthorhombic crystal field, and through the application of group theory and quantum-mechanical perturbation theory, splitting values of 1050, 1320, and 20 300 1/cm have been obtained. In these calculations the contribution of the upper doublet E produced by the octahedral component of the field has been included and its importance is clearly established. The calculated value of the cubic splitting matches the result of optical spectroscopic measurements with Ti(3+) in similar environments, reported by other workers. The magnitudes of the smaller orthorhombic splittings are compared with the predicted value of 1075 1/cm which was obtained from an earlier calculation by Van Vleck applied to a model with trigonal symmetry. The Jahn-Teller effect is discussed as a possible cause of the orthorhombic distortion. (Author)

AD-614 358 Div. 25, 8

Waterloo Univ. (Ontario).
HOT-ELECTRON LOSS VIA WIGGLED AUGER RECOMBINATION IN SEMICONDUCTORS,
by Ling Y. Wei. 1964, 4p
Grants DRB5501 15, NRC1252
Unclassified report

Pub. in Applied Physics Letters (U. S.) v5 n11 p236-8 Dec 1 1964(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electron capture, Semiconductors), (*Semiconductors, Electron capture), (*Diodes (Semiconductor), Hysteresis), Phonons, Crystal lattices, Deformation, Conductivity, Excitation, Electric currents.

AD-614 359 Div. 25

Lockheed Missiles and Space Co., Palo Alto, Calif.
EVIDENCE OF UNPINNED SURFACE SPINS FROM PARALLEL SPIN-WAVE RESONANCES IN PERMALLOY FILMS,
by P. E. Wigen, C. F. Kooi, and M. R. Shanabarger.
1 Jun 64, 10p
Unclassified report

Pub. in Journal of Applied Physics (U. S.) v35 n11 p3302-11 Nov 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Magnetic resonance, Ferromagnetic materials), (*Metal films, Ferromagnetic materials), (*Surface properties, Metal films), Nickel alloys, Iron alloys, Magnetic fields, Spin, Field theory.

The nature of the surface-spin boundary condition and of the parallel resonances for spin-wave resonance in Permalloy films is determined. Computer solutions of

the classical equation of motion of the spins, using the inhomogeneous internal field model, are compared with experimental results. The mode positions and intensities as a function of frequency, film thickness, and internal effective field variation are calculated. This results in the conclusion that the surface spins are unpinned and that the inhomogeneous internal field model is valid for the parallel case as well as for the perpendicular case. The frequency dependence of the intensity of the parallel modes is particularly strong evidence for this conclusion. It is also shown that the mode positions for the perpendicular case are unlikely to reliably determine the surface-spin boundary condition. (Author)

AD-614 360 Div. 25

Lockheed Missiles and Space Co., Palo Alto, Calif.
HANLE EFFECT IN THE He-Ne LASER,
by W. Culshaw and J. Kannelaud. 13 May 64, 13p
Unclassified report

Pub. in Physical Review (U. S.) v136 n5A pA1209-21 Nov 30 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Lasers, Magnetic fields), (*Helium, Lasers), (*Neon, Lasers), (*Excitation, Lasers), Magnetic resonance, Polarization, Electron transitions, Perturbation theory, Gases.

The effect of small magnetic fields on the degenerate levels of the 1.153-micron He-Ne laser transition is considered in the region where the transitions overlap and coherence is imparted by the excitation and induced-emission processes. Perturbation equations for the phenomena are solved by a small-signal approximation, and the probability amplitudes summed coherently to give the resultant intensity and polarization changes. For a symmetrical disposition of the laser frequency with respect to the Zeeman transitions, the polarization remains linear until the states separate beyond the natural linewidth, but rotates with increasing magnetic field. Rotations around 45 degrees are indicated for axial and transverse magnetic fields less than one gauss. With the laser frequency asymmetric with respect to the transitions, elliptical polarization occurs. Investigations on a short planar laser show that such a rotation does take place when small axial magnetic fields are applied and that the polarization remains linear. Some variation with the rf level of excitation is encountered, and there are similar effects at a higher value of dc magnetic field. Studies with sawtooth and ac magnetic fields show the modulation and harmonics which result when the periodic rotation is passed through an analyzer. The separation beyond the natural linewidth is indicated by the appearance of circularly polarized beats at the extremes of the ac fields. The rotation consistently occurs with the laser tuned near the line center and operated well above threshold. (Author)

AD-614 365 Div. 25

Cornell Univ., Ithaca, N. Y.
ANOMALOUS NUCLEAR MAGNETIC RESONANCE LINEWIDTH IN LITHIUM,
by David Zamir, R. C. Wayne, and R. M. Cotts.
18 Feb 64, 4p
Unclassified report

Pub. in Physical Review Letters v12 n12 p327-30 Mar 23 1964 (Copies not available to DDC or Clearinghouse customers).
Research supported by National Science Foundation, Advanced Research Projects Agency and National Bureau of Standards, Washington, D. C.

Descriptors: (*Nuclear magnetic resonance, Lithium), (*Lithium, Nuclear magnetic resonance), (*Line spectrum, Lithium), Anomalies, Relaxation time, Magnetic properties, Phase studies.

The existence of the nuclear magnetic resonance (nmr) linewidth anomaly in lithium and sodium, that the transverse relaxation time, T sub 2 is, less than the longitudinal relaxation time, T sub 1, near the melting point, has been a puzzling question since it was first reported. It is here shown that the anomalous decrease in T sub 2 observed in lithium is largely due to effects of self-diffusion of lithium in large magnetic field gradients which exist in the small particles used in the nmr experiments. These field gradients exist as a consequence of the bulk susceptibility of the metal.

AD-614 367 Div. 25

Illinois Univ., Urbana. Dept. of Physics.
CALCULATION OF THE QUASIPARTICLE RECOMBINATION TIME IN A SUPERCONDUCTOR,
by J. R. Schrieffer and D. M. Ginsberg.
19 Jan 62, 2p
Unclassified report

Pub. in Physical Review Letters v8, n5 p207-8 Mar 1 1962 (Copies not available to DDC or Clearinghouse customers).
Research supported in part by National Science Foundation and Air Force Office of Scientific Research, Washington, D. C., and the A. P. Sloan Foundation.

Descriptors: (*Superconductors, Thermal conductivity), (*Phonons, Superconductors), Electrons, Cryogenics, Integration, Time.

AD-614 369 Div. 25

California Univ., Berkeley.
EFFECT OF MAGNETIC FIELD ON THERMAL CONDUCTIVITY AND ENERGY GAP OF SUPERCONDUCTING FILMS,
by D. E. Morris and M. Tinkham. 27 Apr 61, 3p
Unclassified report

Pub. in Physical Review Letters v6 n11 p600-2 Jun 1 1961 (Copies not available to DDC or Clearinghouse customers)
Supported in part by NSF.

Descriptors: (*Thermal conductivity, Superconductors), (*Metal films, Superconductors), (*Superconductors, Metal films), Magnetic fields, Tin, Indium, Electron transitions, Atomic energy levels, Superconductivity, Cryogenics, Measurement.

The change in the thermal conductivity of superconducting tin and indium films was measured upon application of a magnetic field in the plane of the film. These experiments were undertaken to explore the dependence of the energy gap and the penetration depth upon magnetic field, and to determine the thermodynamic order of the field-induced superconducting transition in films.

AD-614 371 Div. 25

Lockheed Missiles and Space Co., Palo Alto, Calif.
INFLUENCE OF BOUNDARY CONDITIONS ON THE MODAL CHARACTERISTICS OF THIN CYLINDRICAL SHELLS,
Revised ed.,
by Kevin Forsberg. 27 Jul 64, 8p Unclassified report

Pub. in AIAA Journal v2 n12 p2150-57 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cylindrical bodies, Motion), (*Structural shells, Motion), (*Frequency, Boundary layer), Differential equations, Stresses, Moments, Vibration, Guided missiles.

The modal characteristics of thin cylindrical shells have previously been determined only for three sets of boundary conditions. In the present analysis, all sixteen sets of homogeneous boundary conditions have been examined at each end of the shell (each set contains four conditions). The equations of motion developed by Fliigge for thin, circular cylindrical shells are used. The general solution to these equations can easily be written down. One can select a circumferential modal pattern, eight boundary conditions, and a length of shell, and then iterate numerically to find the frequency of vibration that will meet these conditions. The advantage of this approach is that one can obtain a solution to the basic equations for any boundary conditions desired. Results indicate that, contrary to the rather common assumption, the condition placed on the longitudinal displacement u in many cases is more influential than restrictions on the slope or moment. It has been found that even for long cylinders (length to radius ratio of 40 or more) the minimum natural frequency may differ by more than 50% depending upon whether u = 0 or the longitudinal stress resultant N sub x = 0 at both ends. (Author)

AD-614 372 Div. 25

Texas Univ., Austin.
RESONANT ABSORPTION OF ULTRASOUND BY OPEN-ORBIT ELECTRONS IN CADMIUM,
by J. D. Gavenda and B. C. Deaton. 26 Jan 62, 3p
Unclassified report

Pub. in Physical Review Letters (U. S.) v8 n5 pG532 1-2-2 Mar 1 1962 (Copies not available to DDC or Clearinghouse customers).
Supported by NSF and ONR.

Descriptors: (*Resonance absorption, Ultrasonic radiation), (*Electrons, Resonance absorption), (*Cadmium, Electrons), Conductivity, Sound transmission, Atomic energy levels, Magnetic fields.

AD-614 373 Div. 25

Duke Univ., Durham, N. C.
BEAMS OF HELIUM ATOMS AT TEMPERATURES BELOW 0.5 K,
by D. T. Meyer, H. Meyer, W. Hallidy, and C. F. Kellers. 7 Mar 63, 6p
Unclassified report

Pub. in Cryogenics p150-5 Sep 1963 (Copies not available to DDC or Clearinghouse customers)
Supported by NSF, Alfred P. Sloan Foundation, and ARO(D).

Descriptors: (*Helium, Molecular beams), (*Molecular beams, Scattering), (*Cryogenics, Molecular beams), Velocity, Helium, Crysotats, Scientific research.

The report of the experiment shows that, at sufficiently low temperatures, beams of helium-4 atoms can be emitted from a heater, reflected from a wall, and detected by a receiver in an ellipsoid, and justifies the dependence of the beam velocity on the input energy. While several observations can be qualitatively understood, they are, however, difficult to analyse because of the large number of unknown parameters. For example, the shape of the received pulse at the lowest temperatures may be determined by the scattering of the beam on the film covered walls as well as by the velocity distribution during the boiling off process on the heater. There are several phenomena similar to the pre-pulse and the 'ghost' pulse that are puzzling. It would, however, require a systematic study using different cavity geometries to understand them. While no new fundamental discovery has been made in this work, the conditions of the experiment seemed unusual enough to warrant reporting, although the results could be explained only qualitatively and no clear cut interpretation could be given for some of the observations.

AD-614 377 Div. 25

Stanford Univ., Calif.
PREPARATION AND PROTON MAGNETIC RESONANCE STUDIES OF ANHYDROUS AMMONIA,
by Richard A. Ogg, Jr. and James D. Ray.
31 Oct 56, 2p
Unclassified report

Pub. in Journal of Chemical Physics (U. S.) v26 p1515-6 1957 (Copies not available to DDC or Clearinghouse customers)
Supported by OOR and NSF.

Descriptors: (*Ammonia, Nuclear magnetic resonance), (*Nuclear magnetic resonance, Ammonia), Line spectrum, Nitrogen, Isotopes, Nuclear spins, Test methods.

Comparison of high-resolution proton magnetic resonance spectra of anhydrous N(14)H3 and N(15)H3 (99.8% N(15) leads to the conclusion that the line width in N(14)H3 is due to quadrupole relaxation. A new method of preparation of anhydrous, sodium-free ammonia is described. The natural abundance of N(15)H3 in N(14)H3 is shown to be observable by magnetic resonance technique. (Author)

AD-614 378 Div. 25, 9

Graduate Aeronautical Labs., Calif. Inst. of Tech., Pasadena.
END-WALL HEAT-TRANSFER EFFECTS ON THE TRAJECTORY OF A REFLECTED SHOCK WAVE,
by Bradford Sturtevant and Erik Slachmuylders.
30 Oct 63, 7p
Grant NsG40 60
Unclassified report

Pub. in The Physics of Fluids v7 n8 p1201-7 Aug 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Shock waves, Trajectories), (*Reflection, Shock waves), (*Heat transfer, Shock waves), Thermal diffusion, Boundary layer, Reynolds number, Least squares method, Perturbation theory, Nonequilibrium flow, Thermal conductivity.

The trajectory of a reflected shock wave has been measured near the end wall where the motion is perturbed by the displacement effect of heat transfer to the wall. In this experiment an x, t diagram of the reflection of an M = 4.08 shock wave was constructed by measuring shock arrival times with small probes. The parameter that measures the (negative) displacement thickness of the end-wall thermal layer, a 'Reynolds number' R based on the shock velocity, the time after reflection, and the thermal diffusivity was varied between 9 and 600. In this range the measured deviation of the shock trajectory from ideal varied from 11/2 to 17 shock thicknesses. The shock velocity was determined by differentiating a least-squares fit of the data to a fourth-order polynomial

in 1/sq. rt. R. In the range of the experiments the shock accelerated from a velocity that was 20% below ideal to one that was within 4% of ideal. Experiment agrees with boundary-layer theory above R = 150 for the shock trajectory and above R = 25 for the shock velocity, and implies that the exponent of the power-law dependence of the thermal conductivity on temperature is 0.81 ± 0.02. The small deviation of the shock velocity from boundary-layer theory predicted for R < 100 by higher-order theory is not observed, though since this theory falls just within the estimated experimental error this result is somewhat qualified. In any case, the unexpected agreement with first-order theory at small R indicates that molecular effects, such as temperature jump, do not play a large role when the shock is more than ten shock thicknesses from the end wall. (Author)

AD-614 379 Div. 25, 4, 15

Theoretical Chemistry Inst., Univ. of Wisconsin, Madison.
CALCULATION OF SPIN-SPIN INTERACTION INTEGRALS,
by David M. Schrader. 23 Jul 64, 2p
Grant NsG275 62

Unclassified report

Pub. in The Journal of Chemical Physics v41 n10 p3266-7 Nov 15 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Atomic orbitals, Integrals), (*Integrals, Spin), Electrons, Identities, Quantum mechanics.

AD-614 380 Div. 25, 4

Theoretical Chemistry Inst., Univ. of Wisconsin, Madison.
GIBBS' THIRD VARIATIONAL PRINCIPLE IN STATISTICAL THERMODYNAMICS,
by W. Byers Brown. 22 Jun 64, 1p
Grant NsG275 62

Unclassified report

Pub. in The Journal of Chemical Physics v41 n9 p2945 Nov 1 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Thermodynamics, Statistical mechanics), Calculus of variations, Quantum mechanics, Hamiltonian, Energy, Entropy.

In a recent paper Girardeau derived a variational principle for the Helmholtz free energy which is the classical analog of a quantal principle introduced by Bogolubov. The purpose of this note is to point out that the Bogolubov principle is simply a particular form of the well-known fundamental variational principle first derived for the classical case by Gibbs in his book on statistical mechanics in 1901.

AD-614 383 Div. 25

Sloane Physics Lab., Yale Univ., New Haven, Conn.
A QUANTUM MECHANICAL EVALUATION OF LINE BREADTHS INVOLVED IN TUNED-LASER ABSORPTION AND STIMULATED EMISSION SPECTROSCOPY,
by W. R. Bennett, Jr. 1964, 3p
AROD 4313:6

Unclassified report

Pub. in Applied Optics Supplement 2 of Chemical Lasers p78-80 1965
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Lasers, Absorption spectrum), (*Absorption spectrum, Lasers), (*Quantum mechanics, Absorption spectrum), (*Perturbation theory, Lasers), Line spectrum, Tuned amplifiers, Excitation, Organic materials.

An analysis is given of collision- and power-broadening effects in Tuned-Laser Absorption Spectroscopy using time-dependent perturbation theory. The results are compared with the earlier analysis based on the Lorentz theory of collision broadening given by Gerritsen and Heller. Finally, the analysis is extended to include similar broadening effects on the net gain coefficient when both stimulated emission and absorption are involved. (Author)

AD-614 384 Div. 25

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
GENERATION OF A HOT, DENSE PLASMA BY A COLLECTIVE BEAM-PLASMA INTERACTION,
by L. D. Smullin and W. D. Getty. 11 Jun 62, 4p
Grant NSF G9330

Unclassified report

Pub. in Physical Review Letters v9 n1 p3-6 Jul 1 1962
(Copies not available to DDC or Clearinghouse customers).
Revision of manuscript submitted 11 May 62.

Descriptors: (*Plasma medium, Electron beams), (*Electron beams, Plasma medium), Plasma oscillations, Excitation, Cyclotron waves, Electrons.

AD-614 385 Div. 25

North Carolina Univ., Chapel Hill.
PHOTOGENERATION OF FREE CARRIERS IN ORGANIC CRYSTALS VIA EXCITON-EXCITON INTERACTIONS,
by M. Silver, D. Olness, M. Swicord, and R. C. Jarnagin. 13 Nov 62, 3p
Grant NSF G17208

Unclassified report

Pub. in Physical Review Letters v10 n1 p12-4 Jan 1 1963.
(Copies not available to DDC or Clearinghouse customers).
Partially supported by ARPA.

Descriptors: (*Organic compounds, Semiconductors), (*Semiconductors, Electron transition), (*Crystals, Organic compounds), Excitation, Transients, Luminescence, Ultraviolet radiation, Polycyclic compounds.

Results of experimentation are reported that (1) support, for the first time, the theory of free exiton-free exiton interaction in organic crystals and (2) yield a bimolecular rate constant in good agreement with that calculated by Choi and Rice (Sang-il Choi and Stuart A. Rice, Phys. Rev. Letters 8:410 (1962)).

AD-614 391 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
THE BOUNDARY LAYER ON A FLAT PLATE IN ANISOTROPIC MAGNETOHYDRODYNAMICS,
by V. B. Varanov, A. G. Kukilovskii and G. A. Lyubimov. 30 Mar 65, 9p FTD-TT-65-44
TT 65-62067

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR.

Izvestiya. Mekhanika i Mashinostroenie, n1 p141-2 1964.

Descriptors: (*Magnetohydrodynamics, Boundary layer), (*Boundary layer, Flat plate models), Thermodynamics, Magnetic fields, Perturbation theory, Motion, Equations, USSR.

It is demonstrated that when calculating the boundary layer, despite the presence of thermal flow due to Larmor precession of electrons, it is possible to consider the temperature at the limit of the boundary layer as fixed. For this purpose the problem of perturbation in the external flow of the boundary layer is considered.

AD-614 420 Div. 25, 9
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
THE FLOW OF A CONDUCTING GAS JET WITH ALIGNED MAGNETIC FIELD,
by Stanley A. Berger. Mar 65, 35p
Rept. no. RM-4368-ARPA
Contract SD79, ARPA Order 189 61
Unclassified report

Descriptors: (*Magnetohydrodynamics, Boundary value problems), (*Boundary value problems, Magnetohydrodynamics), Gas flow, Nonlinear differential equations.

When an infinitely conducting fluid flows under the influence of a magnetic field in such a way that the velocity and magnetic fields are aligned, then the governing equations may formally be reduced to those of ordinary gas dynamics. The equations are still nonlinear, but if one restricts attention to plane flows, then the hodograph technique may be employed. The equations in the hodograph plane are linear and may be solved exactly. The difficulty then remaining is to satisfy the boundary conditions. Only for restricted classes of problems can this be done. This paper treats one such class of problems: the flow of a jet of gas out of a slit in a rectangular channel. The method used is a modification of the original method of Chaplygin for nonconducting gas jets. (Author)

AD-614 435 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Westinghouse Research Labs., Pittsburgh, Pa.
GROWTH AND CHARACTERIZATION OF SINGLE CRYSTALS OF RARE EARTH COMPOUNDS.
1965, 9p Quarterly technical rept. no. QTR-7
Contract AF49 638 1245
Unclassified report

See also AD-610 361.

Descriptors: (*Rare earth compounds, Single crystals), (*Single crystals, Rare earth compounds), (*Crystal growth, Rare earth compounds), Europium compounds, Sulfides, Lanthanium, Impurities, Barium, Neodymium compounds, Solid solutions, Chromium alloys, Tellurium alloys, Antimony alloys, Electrical conductance, Gadolinium alloys, Silicon, Chromium compounds, Bromide, Crystal lattice defects, Nuclear spins, Magnetism, Transition temperature.

The spin disorder effect on scattering of the conduction electrons was examined together with the increases in the residual resistivity of Gd observed in various intrarare earth alloys. It was found that the extrapolated values of the spin-disorder resistivity reported in the literature were much too small to account for the inelastic scattering with spin flip. This large discrepancy between the calculated and extrapolated value of spin-disorder resistivity has heretofore been overlooked. It may imply the existence of short-range order of spins in the paramagnetic state at temperatures considerably higher than the Curie point. Resistance measurements were conducted on a polycrystalline sample of Si-doped CrBr3. The electrical data revealed that the compound became a semiconductor only in the paramagnetic state. Below the Curie temperature it remained an insulator. The excess electrons donated by the Si atoms in CrBr3 thus behave markedly differently from those donated by La in EuS. Experimental work was continued on the growth of crystals of La-doped EuS. An investigation was begun on Ba-doped NdS. Further progress was made in the study of the magnetic structures of the solid solutions of CrTe and CrSb. (Author)

AD-614 439 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Delaware Univ., Newark. Dept. of Physics.
ELECTRO-OPTICAL METHOD FOR INVESTIGATION OF FIELD AND CURRENT DISTRIBUTIONS IN SEMICONDUCTORS AND LAYER-LIKE FIELD DISTRIBUTIONS IN PHOTOCONDUCTORS.
Status rept. no. 3, 1 Oct-31 Dec 64,
by K. W. Boer. 31 Dec 64, 4p
Contracts Nonr433600, DA31 124ARO D173
Unclassified report

See also AD-608 273.

Descriptors: (*Semiconductors, Field theory), (*Photoelectric materials, Field theory), Single crystals, Crystal growth, Cadmium compounds, Sulfides, Luminescence, Electrical properties, Electron optics, Dielectrics.

AD-614 442 Div. 25, 12
CFSTI Prices: HC$5.00 MF$1.25

RCA Victor Co., Ltd., Montreal (Quebec). Research Labs.
ELECTROMAGNETIC WAVE PROPAGATION IN ANISOTROPIC PLASMAS ALONG THE DIRECTION OF A STATIC MAGNETIC FIELD,
by M. P. Bachynski and B. W. Gibbs. Dec 64, 164p
Research rept. no. RR-7-801-33, SR-1
Contract AF19 628 4071, Proj. 4642, Task 464202
AFCRL 65-84
Unclassified report

Descriptors: (*Electromagnetic waves, Propagation), (*Plasma medium, Electromagnetic waves), Magnetic fields, Phase shift, Cyclotron waves, Polarization, Ionization, Atmosphere entry, Space communication systems, Ionospheric propagation.

An experimental and theoretical investigation of the propagation of electromagnetic waves in an anisotropic plasma along the direction of the applied static magnetic field was conducted. Experimental measurements of electron density and attenuation using circularly polarized waves (left-hand or right-hand) show good agreement with theory and with each other over all ranges of parameters. For the right-hand mode at radio frequencies above the electron cyclotron frequency, 'cut-off' occurs at much lower electron densities than in the absence of a magnetic field. For the left-hand wave, both the phase change and attenuation decrease with magnetic field and the wave is affected much less by the plasma than the right-hand wave over the range of parameters encountered in the experiments. The theory of propagation of a linearly polarized wave in a lossy anisotropic plasma was derived. Investigations of the collisional effects on e-m wave

propagation in the region of the electron cyclotron frequency show a reversal in phase of the wave passing through the plasma as the electron density is increased. This phenomenon occurs only for the right-hand circularly polarized wave at frequencies very near but just above the electron cyclotron frequency. Collisional effects based on cold plasma theory can account for this behavior.

AD-614 445 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Hughes Aircraft Co., Culver City, Calif.
CONTINUOUSLY PULSED LASER DEVICE FOR SURVEILLANCE.
Quarterly Progress rept. no. 2, 1 Oct-31 Dec 64,
by James H. Morse. 31 Dec 64, 19p
Contract DA28 043AMC00326E, Proj. 1P6 22001A056, Task 1P6 22001A056 03

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Lasers, Space surveillance systems), Neodymium compounds, Yttrium compounds, Argon compounds, Garnets, Single crystals, Pumping (Electronics), Xenon lamps, Tungsten, Oscillators.

This report describes experimental Nd:YAG laser heads using both tungsten lamps and xenon flashtubes for pump excitation. These preliminary experiments were directed to gain information for designing high repetition rate, Q switched laser. Final design of the device is being delayed pending the receipt of suitable Nd:YAG crystal. (Author)

AD-614 458 Div. 25, 7
CFSTI Prices: HC$2.00 MF$0.50

Westinghouse Electric Corp., Pittsburgh, Pa.
LONG LIFE CLOSED LOOP MHD RESEARCH AND DEVELOPMENT UNIT.
Quarterly technical progress rept. no. 11,
15 Jan-15 Apr 65,
by R. L. Hundstad, F. A. Holmes, and M. G. Fey.
15 Apr 65, 26p
Contract AF33 657 8311, Proj. 8173, Task 817306

Unclassified report

See also AD-605 365.

Descriptors: (*Magnetohydrodynamics, Generators), Electric power production, Test equipment, Thermocouples, Copper, Tantalum, Compatibility, Plasma physics, Heaters.

This report describes the construction and assembly details of the closed loop test apparatus preparatory to test No 4. It includes description, analysis and design of component parts and a discussion of power lead materials compatability. (Author)

AD-614 461 Div. 25, 13, 14
CFSTI Prices: HC$1.00 MF$0.50

Army Cold Regions and Engineering Lab., Hanover, N. H.
COMPLEX POISSON'S RATIO AND DILATATION CONSTANTS FROM FORCED VIBRATION OF A SPHERE,
by T. M. Lee and J. L. Smith. Feb 65, 17p
Research rept. no. RR-165
Proj. 1V02501A130

Unclassified report

See also AD-611 751.

Descriptors: (*Viscoelasticity, Spheres), (*Spheres, Vibration), Elasticity, Mathematical analysis, Mechanical properties, Harmonic analysis, Strain (Mechanics), Materials.

Following previous investigations on methods of determining dynamic mechanical properties of viscoelastic materials employing forced vibration, this report proposes a similar technique for determining the complex Poisson's ratio and the complex dilatation constants. Through the study of forced vibration of a free viscoelastic sphere with an internal harmonic oscillating source, it is found that these properties of the test material are related to the ratio of the vibration amplitude of two measurable points. Thus, when using the criterion of this ratio approaching its maximum, the maximum amplitude ratio, these properties can be expressed in simple relationship with laboratory-measurable quantities, namely the maximum amplitude ratios and their corresponding vibration frequencies. Investigations have been carried out for three sphere sets. (Author)

AD-614 463 Div. 25, 17

Technische Hochschule, Vienna (Austria).
THE COMPOUNDS DyMn2, HoMn2 AND ErMn2. CALCULATION OF THE ENERGY AND FREE ENTHALPY OF FORMATION OF RE-MERCURY-COMPOUNDS BY VAPOUR PRESSURE MEASUREMENTS AND THERMAL ANALYSIS,
by F. Lihl. 30 Apr 64, 62p
Scientific rept. no. SR-8
Contract AF61 052 609

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Rare earth elements, Alloys), (*Dysprosium, Manganese alloys), (*Holmium, Manganese alloys), (*Erbium, Manganese alloys), (*Manganese alloys, Rare earth elements), Intermetallic compounds, Preparation, X-ray diffraction analysis, Crystal lattices, Powder alloys, Austria, Heat of formation, Entropy, Enthalpy, Mercury alloys, Ytterbium alloys, Samarium alloys, Decomposition, Vapor pressure, Measurement, Phase studies.

The systems Dy-, Ho, Er-Mn was investigated by the amalgam process. The structures and lattice spacings of the compounds DyMn2, HoMn2 and ErMn2 are reported. By vapour pressure measurements of the amalgams in dependence on temperature and composition the heat of formation, the entropy of formation and the free enthalpy of the compounds REHg, REHg2 and REHg3 (RE = Y, Sm) were evaluated. A highly sensitive apparatus was developed for the thermal and differential-thermal analysis of small samples of RE-Mn alloys up to 1500 C. By using this apparatus with the RE-amalgams the heats of formation were proved. The exact temperatures of decomposition of the compounds SmHg, SmHg2 and SmHg3 in dependence on pressure were measured. The compound SmHg4 was established by differential-thermal analysis and by X-ray investigations. It decomposes below the boiling point of mercury in SmHg3 and liquid mercury. From these data phase diagrams at 5 mm Hg and 750 mm Hg of the system Sm-Hg (which is representative for all RE-Hg diagrams) were constructed.

AD-614 482 Div. 25, 17
CFSTI Prices: HC$2.00 MF$0.50

Laboratories for Research and Development, Franklin

Inst., Philadelphia, Pa.
ELECTRONIC STRUCTURE OF DILUTE SOLID SOLUTION ALLOYS OF 3D-TRANSITION METALS IN A NON-MAGNETIC MATRIX.
Summary rept. for 1 Jun 62-31 May 64,
by F. T. Hedgcock, E. W. Collins, and W. B. Muir.
Feb 65, 32p
Contract AF33 657 8744, Proj. 7371, Task 737102
ML TDR-64-163

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Atomic energy levels, Alloys), (*Copper alloys, Atomic energy levels), (*Magnesium alloys, Atomic energy levels), (*Aluminum alloys, Atomic energy levels), (*Zinc alloys, Atomic energy levels), (*Germanium alloys, Atomic energy levels), Electron transitions, Solid solutions, Iron alloys, Manganese alloys, Antimony alloys, Resistance (Electrical), Cryogenics, Superconductivity, Semiconductivity, Magnetic properties, Temperature, Nuclear magnetic resonance, Thermoelectricity, Single crystals, Oscillation, Transport properties, Transition elements.

The electronic structure of dilute alloys has been studied for the following alloy systems - Cu-Fe, Cu-Mn, Cu-Zn, Mg-Mn, Mg-Fe, Al-Mn, Zn-Mn, Mg-Al-Mn and Ge-Sb. The particular electrical and magnetc measurements carried out on these alloys include: (l) Magnetoresistivity as a function of temperature below 4.2 K for superconducting, semiconducting and non-superconducting alloys. (2) Resistivity as a function of temperature between 1.3 K and 380 K. (3) Magnetic susceptibility between room temperature and 4.2 K. (4) Electron spin resonance in the liquid helium temperature region. (5) de Haas van Alphen effect measurements on single crystals. (6) Thermoelectric power below 4.2 K. (Author)

AD-614 485 Div. 25

Louvain Univ. (Belgium).
QUENCHING AND POST-IRRADIATION STUDIES ON CdS SINGLE CRYSTALS. TRANSPORT PROPERTIES OF BISMUTH ROLLED THIN FOILS.
Final scientific rept. for 1 Apr-30 Nov 64,
by Andre Luyckx, Jean-Paul Issi, Jean-Marie Streydio, Jean-Pierre Michenaud, and Paul Coopmans. Jan 65, 56p
Contract AF61 052 776
RADC r-65-156

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Single crystals, Cadmium compounds), (*Cadmium compounds, Sulfides), (*Bismuth, Thermal conductivity), Infrared radiation, Quenching (Cooling), Photoconductivity, Heat treatment, Transport properties, Impurities, Electron transitions, Atomic energy levels, Foils, Mercury, Copper, Bismuth alloys, Antimony alloys, Thermoelectricity, Zinc compounds, Oxides, Crystal growth, Reaction kinetics, Hall effect, Electrical conductivity, Optical properties.

Post-irradiation of CdS doped single crystals with quenching wavelengths produces at room temperature, a sharp peak of photocurrent. Electrons are freed from traps between 01,0 and 1,65 ev below the conduction band and holes from traps between 0,70 and 1,65 ev above the valence band. Some of the levels and relative densities of electrons have been determined. Thermal conductivity of polycristalline and rolled Bi have been compared from 80 to 300K. (Author)

AD-614 487 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Cornell Univ., Ithaca, N. Y.
EXCITON ABSORPTION IN THE PRESENCE OF EXCITED F-CENTERS,
by Dietmar Frohlich and Herbert Mahr. Feb 65, 9p
Technical rept. no. TR-1, MSC-322
Contract Nonr40147

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Color centers, Excitation), (*Excitation, Color centers), Absorption, Crystal lattice defects, Electron transitions, Cryogenics, Lasers.

An experiment is described which measures the optical absorption of crystals containing defects in excited states which will in particular add a new method of studying the excited F-center in alkali halides.

AD-614 494 Div. 25

RCA Labs. Div., Radio Corp. of America, Princeton, N. J.
TUNNELING PROCESSES ACROSS THE CdS-ELECTROLYTE INTERFACE,
by A. Many. 25 Aug 64, 8p
Contract DA31 124AROD84
AROD 4017:6

Unclassified report

Pub. in Journal of Physics and Chemistry of Solids v26 p587-93 1965 (Copies available only to DDC users).

Descriptors: (*Tunneling (Electronics), Cadmium compounds), (*Cadmium compounds, Sulfides), Field emission, Electrolytes, Semiconductors, Crystals, Surface properties, Sulfur.

The high-field behavior of the interface between a conducting CdS crystal and a blocking electrolyte contact is studied by the use of pulse techniques. The method employed is very suitable for determining the characteristics of the space-charge region at the crystal surface. In contrast to the case of d.c. measurements, where breakdown of the blocking contact is not apparent up to fields of at least 2x 10,000,000 V/cm, large transient currents through the interface are observed in the range 5 x 1,000,000 to 10,000,000 V/cm. These currents are ascribed to field emission from surface states into the conduction band of the CdS crusta'/ystal. The surface states are shown to be intimately correlated with electrolytically deposited sulphur. (Author)

AD-614 495 Div. 25
CFSTI Prices: HC$2.00 MF$0.50

Weizmann Inst. of Science, Rehovoth (Israel).
DETERMINATION OF THE CRYSTAL STRUCTURE OF YTTRIUM ORTHOFERRITE AND REFINEMENT OF GADOLINIUM ORTHOFERRITE.
Doctoral thesis,
by M. Eibschutz and P. Coppens. 1 Dec 64, 27p
Technical note no. TN-14
Contract AF61 052 654

Unclassified report

Descriptors: (*Ferrites, Crystal structure), (*Yttrium compounds, Ferrites), (*Gadolinium compounds, Ferrites), X-ray absorption analysis, Least squares method, Tables, Crystal lattice defects, Ions, Crystallography.

The crystal structure of yttrium orthoferrite has been determined from full three-dimensional counter data and refined in the space group Pbnm by least squares to an accuracy of about .001 and .01A in positional parameters of Y(3+) and O(2-) respectively. Parameters are compared with those of GdFeO3, derived by least squares refinement of Geller's intensity data. It is found that the distortions from the ideal perovskite lattice hardly affect the octahedral environment of the Fe(3+) ion, which makes it possible to predict Fe(3+)-O(2-)-Fe(3+) angles in other distorted perovskite structures of known cell dimensions. Refinement in the alternative non-centric space group Pbn2 sub 1, shows small possibly real deviations from a centric structure. (Author)

AD-614 497 Div. 25

National Research Council of Canada, Ottawa (Ontario). Div. of Pure Physics.
IDENTIFICATION OF FREE RADICALS IN FLASH PHOTOLYSIS,
by G. Herzberg and D. N. Travis. 1964, 1p
NRC 8250
Unclassified report

Pub. in Nature v204 n4962 p988 Dec 5 1964 (Copies available only to DDC users).

Descriptors: (*Photochemistry, Free radicals), (*Free radicals, Identification), Band spectrum, Excitation, Organic nitrogen compounds.

McGrath and Morrow have recently reported on a spectrum near 3290 A obtained in the flash photolysis of fulminic acid which they ascribe to the free CNO radical. It appears that this spectrum is the same as that found independently by Jennings and Linnett and the authors. The spectrum has recently been analysed in detail and shown to be due to the free NCN radical. All the strong bands listed by McGrath and Morrow agree with strong NCN bands listed in the author's paper and relative intensities are roughly the same. It is believed that on the basis of the observed intensity alternation and the observed triplet splitting, there can be no doubt that the authors identification of this spectrum is correct. (Author)

AD-614 503 Div. 25

National Research Council of Canada, Ottawa (Ontario) Div. of Pure Physics.
DEVIATIONS OF THE SPECIFIC HEATS OF THE ALKALI METALS FROM HARMONIC BEHAVIOUR, A POSSIBLE DEPENDENCE ON ISOTOPIC COMPOSITION OF THE ANHARMONIC CONTRIBUTION TO SPECIFIC HEAT,
by Douglas L. Martin. 1964, 7p Rept. no. NRC-7886
Unclassified report

Pub. in Lattice Dynamics. Proceedings of the International Conference held at Copenhagen, Denmark, Aug 5-9 1963 (Copies available only to DDC users).

Descriptors: (*Alkali metals, Specific heat), (*Isotropism, Alkali metals), Crystal lattices, Lithium, Isotopes, Lithium alloys, Temperature, Measurement, Canada.

An analysis of the 'high temperature' specific heats of all the alkali metals shows that positive departures from harmonic lattice theory predictions occur at temperatures in the range theta/3 to theta, suggesting the onset of appreciable anharmonic contributions to the specific heat in this temperature range. A further positive anomaly is observed starting at temperatures of about 50 K below the melting point (except possibly in lithium) and is believed to correspond to the thermal generation of lattice vacancies. Recent measurements have shown that at low temperatues the specific heats of alloys of the two isotopes of lithium are intermediate between the specific heats of the separated isotopes. However, as the temperature is increased the specific heats of the alloys increase more rapidly than do the specific heats of the separated isotopes. As a result by 300 K (where the lattice constants of the alloys and pure isotopes are probably all the same) the specific heats of alloys containing more than about 50 per cent (7) Li exceed the specific heat of pure (7) Li (which is itself greater than the specific heat of pure (6)Li). These results suggest that the anharmonic contribution to the specific heat may depend on isotopic composition. However, the observed effect is rather small (less than 1 per cent of the total specific heat) and an independent set of measurements is desirable to confirm its existence and magnitude. (Author)

AD-614 504 Div. 25, 4

National Research Council of Canada, Ottawa (Ontario) Div. of Pure Physics.
INFRARED SPECTROSCOPY... WHERE DO WE GO FROM HERE.
by R. Norman Jones. 1965, 9p
Rept. no. NRC-8121
Unclassified report

Pub. in Canadian Spectroscopy v10 n2 Mar 1965 (Copies available only to DDC users)
Lecture presented at the Ottawa Symposium on Applied Spectroscopy, 18 Sep 63.

Descriptors: (*Infrared spectroscopy, Chemistry), (*Chemistry, Infrared spectroscopy), Theory, Band spectrum, Absorption spectrum, Graphics, Interferometers, Raman spectroscopy.

AD-614 520 Div. 25

National Research Council of Canada, Ottawa (Ontario). Div. of Pure Physics.
THE SPECIFIC HEATS BELOW 320K OF POTASSIUM, RUBIDIUM AND CAESIUM,
by J. D. Filby and Douglas L. Martin. 28 May 64, 25p NRC-8271
Unclassified report

Pub. in Proceedings of the Royal Society, A v284 p83-98 1965 (Copies available only to DDC users).

Descriptors: (*Potassium, Specific heat), (*Rubidium, Specific heat), (Cesium, Specific heat), Cryogenics, Low-temperature research, Measurement, Melting.

The specific heat of potassium was measured in the range 0.4 to 26K and the specific heats of rubidium and caesium in the range 0.4 to 320K. Previously reported specific heat anomalies in the range 100 to 300K were not confirmed. A slow release of energy dependent on thermal history, was observed from rubidium and caesium in the region of 4K and may correspond to the annealing out of defects introduced by plastic strain on cooling. Positive anharmonic contributions to the specific heat are evident at high temperatures and an additional contribution to the specific heat becomes apparent from about 50K below the melting point and may

be identified with the thermal generation of lattice vacancies. The melting point of pure rubidium is estimated as 312.65±0.01K and the latent heat of fusion as 524.3±1.0 cal/gatom. For caesium the melting point is 301.55+0.01K and, with some assumptions, the latent heat is 498.9±0.5 cal/gatom. For both metals the specific heat of the liquid decreases with increasing temperature. (Author)

AD-614 527 Div. 25

Purdue Univ., Lafayette, Ind.
DETERMINATION OF ELECTRON RELAXATION TIME FROM THE GIANT QUANTUM OSCILLATIONS IN THE ACOUSTIC ABSORPTION OF METALS,
by John J. Quinn. 11 Dec 64, 6p
AROD 3655:12

Unclassified report

Pub. in Solid State Communications v4 n2 p25-9 1965 (Copies available only to DDC users).

Descriptors: (*Electrons, Relaxation time), (*Relaxation time, Electrons), (*Acoustic properties, Metals), (*Quantum mechanics, Relaxation time), Absorption, Oscillation, Cyclotron waves, Sound transmission.

The effect of collisions on the giant quantum oscillations in the acoustic absorption of metals is studied. It is predicted that the giant oscillations will disappear and then reappear as the acoustic frequency is increased. The disappearance occurs for frequencies in the range of the electron collision frequency; thus the effect offers a new method of studying the electron relaxation time. (Author)

AD-614 529 Div. 25

Purdue Univ., Lafayette, Ind.
EFFECT OF UNIAXIAL STRESS ON THE EXCITATION SPECTRA OF DONORS IN SILICON,
by R. L. Aggarwal and A. K. Ramdas. 1964, 6p
Contract DA31 124 ARO D17
AROD 3655:13

Unclassified report

Pub. in Physique des Semiconducteurs v51 p797-802. (Copies available only to DDC users).

Descriptors: (*Silicon, Excitation), (*Excitation, Band spectrum), (*Stresses, Silicon), Semiconductors, Strain (Mechanics), Deformation, Potential theory, Symmetry (Crystallography), Polarization, Conductivity, Cryogenics.

When a uniaxial stress is applied to a multivalley semiconductor like silicon, the various conduction band minima shift in energy with respect to one another. Further, the site symmetry of a substitutional Group V donor in silicon, which is T in the unstrained crystal, is lowered by the stress. The purpose of the present paper is to report experimental observations on the splittings and the polarization effects exhibited by the excitation lines of neutral Group V donors in silicon subjected to uniaxial stress, and interpret them on the basis of the above effects.

AD-614 531 Div. 25, 4

Franklin Inst., Philadelphia, Pa.
DIFFUSION IN ORGANIC CRYSTALS. I. SELF-DIFFUSION IN ANTHRACENE,
by C. H. Lee, H. K. Kevorkian, P. J. Reucroft, and M. M. Labes. 1 Oct 64, 5p
AROD 4168:2

Unclassified report

Pub. in Journal of Chemical Physics v42 n4 p1406-10 Feb 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Single crystals, Polycyclic compounds), (*Polycyclic compounds, Diffusion), (*Diffusion, Tracer studies), Films, Labelled substances, Crystal structure, Thermodynamics, Organic materials.

Self-diffusion in high-purity anthracene single crystals was measured by means of a microtome sectioning technique with anthracene-9C(14) as a tracer, in the temperature range from 140 to 196C. The possible mechanism, the anisotropic nature of the diffusion process, and the results as compared with a previous investigation are discussed in detail. (Author)

AD-614 533 Div. 25

Cornell Univ., Ithaca, N. Y.
PHOTOIONIZATION CROSS SECTION OF HELIUM IN THE 100- TO 250-A REGION,
by J. F. Lowry, D. F. Tomboulian, and D. L. Ederer.
6 Jul 64, 7p Technical rept. no. TR-7
Contract DA31 124ARO D43, Proj. 2810P
AROD 2810:7

Unclassified report

Pub. in The Physical Review v4A pA1054-57 15 Feb 65. Copies not available to DDC or Clearinghouse customers.

Descriptors: (*Helium, Ionization), (*Ionization, Probability), (*Atomic spectroscopy, Helium), Ultraviolet spectroscopy, Excitation, Electron transitions, Photons, Atomic structure.

The absolute K-photoionization cross section of helium has been measured in the region extending from 100 to 250 A to a precision of 5% or better. Above 250 A, where the present results overlap with earlier work preformed in this laboratory, there is satisfactory agreement and the data have been combined so as to extend the range of measurements by about 8 Ry above the ionization threshold. It has been possible to join these results with a previous observation made at a higher energy (20.3 Ry) so that helium is the only gas other than Ne for which the cross section is known over a large energy range with comparable precision. This information, combined with the outcome of theoretical calculations and with estimates of discrete oscillator strengths, has led to the evaluation of four sum rules. The calculations attest to the reliability of the observations. (Author)

AD-614 534 Div. 25, 4

Indiana Univ., Bloomington, Dept. of Chemistry.
AUTO- AND CROSS-CORRELATION FUNCTIONS USED AS TOOLS FOR INFORMATION RETRIEVAL IN ELECTRON DIFFRACTION STRUCTURE STUDIES,
by M. Traetteberg and R. A. Bonham. 7 Aug 63, 10p
Grant AF AFOSR602 64
AFOSR 65-0682

Unclassified report

Pub. in Journal of Chemical Physics v42 n2 p587-96 Jan 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Molecular structure, Electron diffraction

analysis), (*Electron diffraction analysis, Molecular structure), (*Statistical functions, Molecular structure), Information retrieval, Integral transforms.

Three radial distribution functions f(r), the power spectrum, the diagonal power spectrum, and the sharpened radial distribution function have been introduced, and it is shown that these functions might be useful tools in extracting molecular information from a gas electron diffraction experiment. The two kinds of power spectra are based on short-interval auto- and cross-correlation functions of the molecular intensity function, while the sharpened radial distribution function is defined as the Fourier sine transform of the product of the molecular intensity function and the antidamping function. The similarity between the power spectrum and the sharpened radial distribution function has been pointed out. By examples based on experimental data and numerical calculations based on theoretical data it is shown that the modified f(r) functions introduced give better resolution between neighboring peaks than the radial distribution function that is normally applied in electron diffraction structure studies. The errors introduced in r sub ij values determined from the various f(r) functions, due to additive random errors in the molecular intensity function, have been studied by numerical analysis, and it has been shown that accurate structural parameters can be extracted from sharpened f(r) functions. (Author)

AD-614 541 Div. 25

Louvain Univ. (Belgium).
THE SIGNIFICANCE OF SINGULAR CONFIGURATIONS OF STRUCTURES FROM THE STRENGTH OF MATERIALS POINT OF VIEW,
by F. Buckens. 1 Aug 64, 10p
Grant AF EOAR62 107
AFOSR 65-0618

Unclassified report

Pub. in Journal de Mecanique v3 n4 p499-508 Dec 1964 (Copies available only to DDC users).

Descriptors: (*Structural parts, Configuration), (*Deformation, Structures), Mechanical properties, Rods, Mathematical analysis.

Simply connected structures, consisting of simple bars connecting multiple hinges, are considered. Furthermore external forces are assumed to act on these hinges. It is shown that when the configurations of the linkages are singular -- that is, when there exist parasitic degrees of freedom for small deformations of the structure which do not change the lengths of the bars -- the forces appearing in the bars become infinite when certain exceptional conditions are not satisfied by the external loading. (This assumes vanishingly small bar elongations). A necessary condition to avoid infinite forces when the configuration is singular, is that the work performed by the external forces on the small parasitic deformation be null. This is also a sufficient condition when the structure is statically determinate. (Author)

AD-614 542 Div. 25

Ohio State Univ., Columbus.
ON THE CONTACT ANGLE IN HETEROGENEOUS NUCLEATION UPON A SUBSTRATE,
by K. L. Moazed and J. P. Hirth. 17 Sep 64, 13p
AROD 4397:1

Unclassified report

Pub. in Surface Science v3 p49-61 1964 (Copies available only to DDC users).
Research supported in part by National Science Foundation, Washington, D. C.

Descriptors: (*Nucleation, Surface properties), (*Surface properties, Nucleation), Liquids, Gases, Condensation, Evaporation, Equations.

The dependence of the nucleation rate equation on the contact angle parameter theta is analyzed for heterogeneous nucleation from vapor or from liquid. It is shown that externally imposed constraints lead to three types of solution for theta: (a) no real solution, (b) one real solution, and (c) two real solutions, the last of which has not been considered heretofore. The physical significance of each case is considered. A comparison is made with available experimental data. (Author)

AD-614 545 Div. 25, 15

Connecticut Univ., Storrs.
CHARGE-STATE CORRELATIONS IN Ar(+) -Ar COLLISIONS,
by Edgar Everhart and Quentin C. Kessel.
22 Jan 65, 3p
AROD 2805:11

Unclassified report

Pub. in Physical Review Letters v14 n8 p247-49 22 Feb 65.
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Argon, Scattering), (*Atomic charge, Argon), (*Statistical distributions, Atomic charge), Correlation techniques, Probability, Ion bombardment, Ionization.

AD-614 550 Div. 25, 4

Northwestern Univ., Evanston, Ill. Dept. of Materials Science.
DIFFUSION OF SULFUR 35 IN SINGLE CRYSTALS OF LEAD SULFIDE AS A FUNCTION OF STOICHIOMETRY AND DOPING ADDITIONS,
by M. S. Seltzer and J. B. Wagner, Jr. 20 May 64, 11p
Technical rept. no. TR-3
Contract Nonr122824, Proj. NRO32 471

Unclassified report

Pub. in Journal of Physics and Chemistry of Solids v26 p233-42 1965 (Copies available only to DDC users).

Descriptors: (*Single crystals, Lead compounds), (*Lead compounds, Sulfides), (*Sulfur, Diffusion), (*Diffusion, Sulfur), Temperature, Pressure, Impurities, Silver, Bismuth, Atomic energy levels, Tracer studies, Phase studies.

Self-diffusion of sulfur 35 in single crystals of lead sulfide was studied as a function of temperature, sulfur pressure and foreign atom additions. The primary conclusions of these studies are: (a) sulfur diffuses as rapidly as or more rapidly than lead in single crystals of PbS, (b) sulfur does not diffuse via jumps into sulfur vacancies. In addition sulfur was inferred to diffuse via several simultaneous mechanisms, the predominant one depending on the experimental variables. The probable predominant mechanisms in undoped PbS are: (1) In crystals with an excess of sulfur, sulfur diffuses as an atomic rather than as an ionic species, by an interstitial mechanism, or via electrically neutral vacancies in the lead sublattice; (2) In crystals with an excess of lead, sulfur diffuses via a neutral defect pair. Sulfur diffuses through lead sulfide heavily doped with the acceptor silver by the same mechanisms that are predominant in undoped PbS. This is evidence by the lack of influence of silver concentration on diffusivities in the temperature range 500-750C, which serves to substantiate the neutral electrical nature of the defects responsible for diffusion in

undoped PbS. For lead sulfide doped with the donor bismuth, sulfur diffusion at 700C occurs by the same mechanisms as are predominant in undoped PbS over the entire homogeneity range for the compound. At lower temperatures, jumps of sulfur into ionized lead vacancy acceptors, such as V'Pb may contribute appreciably to the total diffusion. (Author)

AD-614 552 Div. 25, 4

Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
CHARGE-TRANSFER ABSORPTION SPECTRA OF NO IN Kr AND CH3OH SOLUTIONS,
by Eldon E. Ferguson and H. P. Broida. 29 Jan 64, 2p
Contract Nonr422201

Unclassified report

Pub. in Journal of Chemical Physics v40 n12 p3715-6 Jun 15 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Diatomic molecules, Absorption spectrum), (*Nitrogen compounds, Absorption spectrum), (*Absorption spectrum, Nitrogen compounds), Oxides, Krypton, Alcohols, Band spectrum.

It is proposed that a broad, structureless absorption previously observed near 2400 A in the spectrum of NO in condensed krypton is due to charge transfer, probably of the type known as 'contact charge transfer'. On the basis of energetic considerations, NO should act as the donor in this case. A similar absorption observed in NO dissolved in methanol solution is probably due to the same phenomenon with NO being the donor, and not the acceptor as previously suggested. (Author)

AD-614 553 Div. 25, 4

National Bureau of Standards, Boulder, Colo.
OPTICAL DETECTION OF MICROWAVE TRANSITIONS BETWEEN EXCITED ELECTRONIC STATES OF CN AND THE IDENTIFICATION OF THE TRANSITIONS INVOLVED,
by K. M. Everson, J. L. Dunn, and H. P. Broida.
10 Jul 64, 6p

Unclassified report

Pub. in Physical Review v136 n6A pA1566-71 Dec 14 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cyanogen, Electron transitions), (*Microwave spectroscopy, Cyanogen), (*Excitation, Cyanogen), (*Pumping (Electronics), Microwave spectroscopy), Hyperfine structure, Molecular rotation, Perturbation theory, Band spectrum, Atomic energy levels.

Thirteen microwave transitions in the frequency range from 8800 to 9900 MHz have been observed between excited electronic states of CN. These correspond to all allowed transitions, delta F = 0, ±1, in the K' = 4 perturbation complex between the three hyperfine levels of the unperturbed component of the lambda doublet of the A 2II sub 3 3/2 (v = 10) level and the three hyperfine levels in each of the perturbed and the unperturbed components of the spin doublet of the B 2 sigma (+) (v = 0) level. The identification of all allowed transitions permits a unique determination of nine of the 12 hyperfine energy levels of this perturbation complex. The measured energy separation in this level of the 2 sigma state is interpreted in terms of the electronic structure of the CN molecule in the following paper. The experiment is the first microwave measurement of the fine and hyperfine structure of an excited electronic state of a molecule and also is the first accurate measurement of the hyperfine structure of a 2 sigma state. CN was produced predominantly in the metastable A 2II state by a chemical reaction when methylene chloride was added to a nitrogen afterglow. Resonant microwave pumping from the II state increased the population of the three hyperfine levels of each sigma state by 0.1 to 5%. (Author)

AD-614 557 Div. 25

National Magnet Lab., Mass. inst. of Tech., Cambridge.
BAND STRUCTURE AND MAGNETISM OF GADOLINIUM METAL,
by J. O. Dimmock and A. J. Freeman. 18 Nov 64, 3p
Contract AF49 638 1468
AFOSR 65-0605

Unclassified report

Pub. in Physical Review Letters v13 n25 p750-2 Dec 21 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Gadolinium, Atomic structure), (*Magnetic properties, Gadolinium), (*Band spectrum, Gadolinium), Potential theory, Perturbation theory, Conductivity, Specific heat, Brillouin zones.

AD-614 558 Div. 25, 15

National Magnet Lab., Mass. Inst. of Tech., Cambridge.
FARADAY EFFECT IN SOLIDS,
by Herbert S. Bennett and Edward A. Stern.
21 Aug 64, 14p
Contract AF49 638 1468
AFOSR 65-0604

Unclassified report

Pub. in Physical Review v137 n2A pA448-61 Jan 18 1965 (Copies not available to DDC or Clearinghouse customers).
Revision of manuscript submitted 18 May 64.

Descriptors: (*Magneto-optic effect, Solids), (*Solids, Magneto-optic effect), Conductivity, Tensor analysis, Reflection, Quantum mechanics, Magnetic fields, Field theory, Crystal structure, Ferromagnetic materials, Spin, Relaxation time.

Expressions for the weak-field Faraday effect in cubic materials are presented for the cases of transmission and reflection. These expressions contain the elements of the complex conductivity tensor. General quantum-mechanical expressions for the diagonal and off-diagonal elements of the frequency-dependent conductivity tensor are computed for arbitrary external magnetic fields and in the zero-wave-vector limit with the aid of dispersion relations. Sum rules for the conductivity tensor elements are also derived. The high-frequency limits of the conductivity elements are shown to reduce to the free-electron-gas results. A simple physical interpretation of the effect of the magnetic field on the conductivity tensor is given and this shows that two effects could contribute to the Faraday effect. These are the Zeeman splittings of the energy levels and the changes of the matrix elements. A calculation of the Faraday effect in the effective-mass approximation is performed. Special attention is given to the contribution of the spin-orbit interaction to first order and it is shown that for practically all nonferromagnetic metals this can be an appreciable effect on the interband part. (Author)

26. Production and Management

AD-614 113 Div. 26, 17, 30
CFSTI Prices: HC$1.00 MF$0.50

Army Materials Research Agency, Watertown, Mass.
ULTRASONIC SPECTROSCOPY OF STEEL,
by Otto R. Gericke. Dec 64, 25p
Technical rept. no. AMRA-TR-64-44
Proj. 1A024401A11001, Task 35216
Unclassified report

Descriptors: (*Steel, Non destructive testing), (*Spectrum analyzers, Ultrasonic radiation), (*Ultrasonic radiation, Non-destructive testing), Microstructure, Grain structures (Metallurgy), Pulse analyzers, Attenuation, Scattering, Transducers, Piezoelectric crystals, Spectroscopy.

An electronic instrument has been developed which makes it possible to obtain the ultrasonic attenuation spectrum of a solid material. The spectroscope employs the ultrasonic pulse-echo test technique and is equipped with a single ultrasonic transducer which is used for both transmission and reception of ultrasonic signals. Special electronic circuitry provides improved uniformity of transducer frequency response with the result that a frequency range of 3 to 12 mc can be covered. The ultrasonic spectroscope has been applied to examine microstructures of steel specimens differently heat treated to produce grain size variations. Experimental results indicate that the amplitude distribution in the ultrasonic spectrum is strongly influenced by specimen microstructure. It is possible to discriminate between grain sizes varying from 2 to 8 (ASTM scale) on the basis of ultrasonic attenuation spectra observed. Compared with conventional multiple-back-echo attenuation testing, the spectroscopic method offers the advantage that measurements can be carried out much faster. A further feature of the technique is that the back-echo amplitude is not involved in the measurement and thus can be used as a control indication to continuously monitor overall equipment sensitivity and transducer coupling conditions. (Author)

AD-614 120 Div. 26, 15
CFSTI Prices: HC$2.00 MF$0.50

Columbia Univ., New York. School of Engineering and Applied Science.
OPTIMAL RANDOMIZED REPLACEMENT UNDER MARKOVIAN DETERIORATION.
Rept. for Jul 63-Dec 64,
by Peter J. Kolesar. 15 Apr 65, 28p
Technical rept. no. TR-27
Contract Nonr26655; Grant NSF GP2202,
Proj. NR042 099 Unclassified report

Descriptors: (*Replacement theory, Optimization), (*Stochastic processes, Replacement theory), (*Linear programming, Replacement theory), Life expectancy, Control, Decision theory.

The nature of the optimal replacement rules for a system subject to Markovian deterioration and failure is studied. It is shown that under a generalized aging property a randomized control limit rule maximizes the expected cycle length of the system subject to an upper bound on the probability of failure. (Author)

AD-614 127 Div. 26, 17
CFSTI Prices: HC$1.00 MF$0.50

Army Materials Research Agency, Watertown, Mass.
A STUDY OF THE EFFECT OF HEAT TREATMENT ON THE MICROSTRUCTURE AND PROPERTIES OF SPRAYED MOLYBDENUM,
by David J. Sellers and Milton Levy. Dec 64, 22p
Technical rept. no. AMRA TR-64-50
Proj. 1A024401A11003, Task 35232
Unclassified report

Descriptors: (*Molybdenum, Sintering), (*Sintering, Molybdenum), Heat treatment, Material forming, Sprays, Oxides, Molybdenum compounds, Powder metallurgy, Microstructure, Tensile properties, Elasticity, Density, Hydrogen, Hardness, Metallography, Flame spraying.

The effect of sintering on the microstructure, mechanical and physical properties of free-standing, oxyacetylene and arc-plasma-sprayed molybdenum bodies was studied. Significant increases in tensile strength, modulus of elasticity, density, and purity of sprayed molybdenum were achieved by a hydrogen sinter. A microstructure similar to recrystallized molybdenum sheet was obtained. (Author)

AD-614 269 Div. 26, 18
CFSTI Prices: HC$1.00 MF$0.50

Lockheed Missiles and Space Co., Sunnyvale, Calif.
WRITING AND SUBMITTING THE SUCCESSFUL PROPOSAL. A SELECTIVE ANNOTATED BIBLIOGRAPHY,
comp. by Eugene E. Graziano. Oct 62, 3p
Rept. no. SB-62-52
Unclassified report

Descriptors: (*Procurement, Reports), (*Reports, Preparation), Engineering, Bibliographies.

AD-614 277 Div. 26, 17
CFSTI Prices: HC$1.00 MF$0.50

Army Materials Research Agency, Watertown, Mass.
HOMOGENIZATION OF HIGH-STRENGTH STEEL AT 2500 F,
by Francis C. Quigley and Paul J. Ahearn. Dec 64,
21p Technical rept. AMRA-TR-64-42
Proj. 1A024401A11001, Task 35215
Unclassified report

Descriptors: (*Steel, Heat treatment), (*Heat treatment, Steel), (*Castings, Heat treatment), Castings, Ductility, Tensile properties, Mechanical properties, Phase studies, Diffusion.

Unidirectionally solidified high-strength steel was homogenized at 2500 F for extended periods of time. The mechanical properties resulting from such treatments were compared with the properties of the material heat treated in the standard way. The improved ductility associated with the 2500 F homogenization is attributed to a reduction in the extent of micro-segregation with increasing homogenization time. First principles were employed to show that the increase in ductility is a function of time of homogenization and diffusion coefficient of segregated alloying elements over the square of the distance from the surface of the casting to the test location. (Author)

AD-614 307 Div. 26

Pacific Naval Lab., Esquimault (British Columbia).
AN ULTRASONIC METHOD FOR EVALUATING BONDS IN LARGE METALLIC BEARINGS.
Reprint,

by B. F. Peters. Jun 64, 4p Reprint 64-4
Unclassified report

(Copies not available to DDC or Clearinghouse customers.)

Descriptors: (*Composite materials, Bearings), (*Bearings, Bonded joints), (*Quality control, Bonded joints), (*Ultrasonic radiation, Non-destructive testing), Steel, Tin alloys, Antimony alloys, Copper alloys, Surface properties, Test methods, Transducers, Canada.

This paper describes an ultrasonic method for evaluating the quality of bonds in large metallic bearings. The study was initiated after an examination of a number of failures of large main bearings indicated that the babbitt and steel were only partially bonded. The method of evaluating the bonds consists of applying a 2.5 Mc double-transducer probe to the babbitt, and comparing the relative intensities of two reflected signals, one due to transmission through the interface, and the other due to reflection from the interface. The greater the relative strength of the signal transmitted by the interface, the better the quality of the bond. A correlation is made between the amplitude relationship of the ultrasonic signals and the approximate percentage bonding in a number of experimental bearings. It appears that the method could be utilized for evaluating bonds in actual bearings, provided that the bearings were quite large and that the steel backing was not notched or grooved. (Author)

AD-614 408 Div. 26
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
SOME COST ACCOUNTING PROBLEMS IN PERT COST,
by L. S. Hill. Mar 65, 14p Rept. no. P-3085
Unclassified report

Descriptors: (*Management control systems, Costs), (*Costs, Management control systems), Management planning, Labor, Distribution (Economics).

In the PERT Cost system, the overall program is divided into successively smaller pieces of prime hardware, support equipment, facilities, and services for costing purposes. Estimates are made of manpower, material, and other resources necessary to perform groups of activities referred to as work packages. These are then converted to dollars. The original estimates are compared to actual costs on a periodic basis. PERT Cost seeks to integrate time and cost considerations on a common framework. The focus of this Paper is on a general category of cost accumulation problems affecting the operation of the PERT Cost system.

AD-614 450 Div. 26, 8
CFSTI Prices: HC$1.00 MF$0.50

Aeroprojects, Inc., West Chester, Pa.
ULTRASONIC WELDING PROCESS AND EQUIPMENT FOR CONSTRUCTION OF ELECTRON-TUBE MOUNTS.
Quarterly progress rept. no. 10, 1 Oct-31 Dec 64,
by J. G. Thomas. 31 Dec 64, 16p
Contract DA36 039sc86741
Unclassified report

See also AD-612 600.

Descriptors: (*Welding, Ultrasonic radiation), (*Electron tubes, Welding), (*Ultrasonic radiation, Welding), Electron tube parts, Tungsten alloys, Rhenium alloys, Welding rods, Wire, Small tools, Welds.

During the period of operator training and preproduction evaluation with the 600-watt ultrasonic welder at Tung-Sol Electric Incorporated, difficulties developed with some of the special tools required for fabrication of the Type 6080WB electron tube. Some trouble was also experienced with replacements fabricated at Aeroprojects to the specifications of the original tools. Remedial action for these difficulties has been initiated, and tools have been redesigned for resistance to accidental damage. The 600-watt welder has been returned to Aeroprojects' laboratories for systematic checkout of the redesigned tooling and review of the assembly sequence for the Type 6080WB electron tube. Three welding tips and one anvil assembly have been fabricated and evaluated, and the remaining tooling revisions will be completed shortly. Investigations with the tungsten-rhenium wire, as well as the molybdenum frame grid welding study, have been curtailed because of the effort required with the redesign and evaluation of the tube welding tools. A 600-watt welding tip for the frame grid welding study has been fabricated, and welding investigations will be resumed during the forthcoming report interval. (Author)

AD-614 467 Div. 26, 14
CFSTI Prices: HC$2.00 MF$0.50

Linden Labs., Inc., State College, Pa.
MACHINING HIGH PURITY ALUMINA.
Quarterly rept. no. 2, 1 Oct-31 Dec 64,
by P. A. Marshall, Jr. and J. M. Infield.
31 Dec 64, 27p
Contract DA36 039AMC03634E
Unclassified report

Descriptors: (*Machining, Ceramic materials), (*Aluminum compounds, Oxides), (*Ceramic materials, Machining), Surface properties, Chemical milling, Hydrochloric acid, Hydrogen compounds, Fluorides, Acids, Impregnation, Silicon compounds, Dioxides, Cutting tools, Density, Heat treatment.

Material A-96 selected for the machining demonstration can be drilled, ground, threaded, slotted, tapped and turned. The material can be readily removed by either a grinding wheel or a single point cutting tool. Care must be exercised when using a single point cutting tool with regard to feeds, speeds, tool geometry, and cutting angles. The chemistry behind the acid treating and the reconstitution are not fully understood. The material A-96 treated alumina appears to be able to be reconstituted to a dense body of higher purity than the original body. Hydrofluoric acid seems to attack most bodies more readily than hydrochloric acid and 52% aqueous HF seems to attack more readily than 70% aqueous HF. There appears to be some optimum per cent aqueous acid between 70% and 40%. (Author)

AD-614 535 Div. 26

Saskatchewan Univ., Saskatoon.
ANALYSIS OF A LOADED HIGH-PRESSURE HYDRAULIC ON-OFF SERVOMECHANISM,
by P. N. Nikiforuk and D. R. Westlund. 23 Mar 64, 8p
Grants NRC A1080, DRB9550 15
Unclassified report

Pub. in Journal Mechanical Engineering Science v6 n4 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Servomechanisms, Hydraulic systems), (*Hydraulic systems, Servomechanisms), Valves, Solenoids, Damping, Viscosity, Control systems, Canada.

The paper is concerned with the response of a loaded, high-pressure hydraulic on-off servomechanism to

sinusoidal and transient input signals. The hydraulic system is of conventional closed-loop configuration with the exception of the power element. This element is a solenoid-operated, on-off valve which is activated by electromechanical relays. The load is comprised of a mass, very heavy viscous damping and Coulomb friction. The system is subject to velocity limitation, and force reversal does not normally occur during a half-period of the input excitation. The describing function technique is used to evaluate the frequency response and piecewise linearization to evaluate the transient response. Experimental verification is included. (Author)

27. Propulsion Systems

AD-613 962 Div. 27
CFSTI Prices: HC$2.00 MF$0.50

Brown Engineering Co., Inc., Huntsville, Ala. Research Labs.
TRANSIENT CHAMBER PRESSURE AND THRUST IN SOLID ROCKET MOTORS,
by Hans H. Seidel. Mar 65, 37p
Technical note no. TN-R-138
Contract DA01 021AMC11528Z
Unclassified report

Descriptors: (*Rocket motors (Solid propellant), Thrust), (*Combustion chambers, Pressure), Mathematical analysis, Differential equations, Rocket motor nozzles, Performance (Engineering), Design.

An analysis of solid rocket motors was made in order to find the chamber pressure and thrust during the transient periods of buildup and decay. The results are differential equations and solutions of closed form. (Author)

AD-613 992 Div. 27
CFSTI Prices: HC$3.00 MF$0.50

Naval Ordnance Test Station, China Lake, Calif.
THE EFFECT OF AN INTENSE MAGNETIC FIELD ON ROCKET NOZZLE HEAT TRANSFER. PART 1: THEORY AND SUPERCONDUCTING MAGNET EXPERIMENTS.
Rept. for Apr 62-Jul 63,
by Leroy J. Krzycki, William M. Byrne, Jr., and James B. Lee. Nov 64, 52p Rept. no. NOTS-TP-3467
Task RRRE06007 216 1F009
NAVWEPS 8494 P1
Unclassified report

Descriptors: (*Magnetic fields, Rocket nozzles), (*Rocket nozzles, Magnetic fields), (*Heat transfer, Rocket nozzles), Theory, Experimental data, Solenoids, Superconductors, Vibration, Ignition, Plasma medium, Acoustics, Turbulent boundary layer, Fluid mechanics.

A theoretical and experimental investigation of the effect of an axial magnetic field on rocket nozzle heat transfer is reported. Results of heat transfer experiments using an aircore superconducting solenoid were inconclusive. For magnetic flux densities up to 1.5 webers/sq m there was no observable change in heat transfer from the combustion gas to the rocket nozzle wall. Rocket engine vibration decreased the stability of superconducting solenoid operation; in turn, the magnetic field perturbed the ignition characteristics and combustion chamber pressure of the rocket engine. The experimental investigation is continuing and will use a cryogenically-cooled magnet powered by a battery bank; results from this investigation will be documented in Part II of this Report. (Author)

AD-614 094 Div. 27, 17
CFSTI Prices: HC$1.00 MF$0.50

Army Materials Research Agency, Watertown, Mass.
THE USE OF THE CRITICAL THICKNESS CONCEPT IN DESIGN,
by Robert N. Katz and Kenneth H. Abbott.
Dec 64, 24p Technical rept. no. AMRA TR-64-51
Proj. 1A024401A11002, Task 35222
Unclassified report

Descriptors: (*Rocket cases, Design), Thickness, Fracture (Mechanics), Toughness, Transition temperature, Brittleness, Fractography, Steel.

A brief review of the 'critical thickness' concept is presented. Three actual examples of solid rocket motor case designs are then discussed. In the first example, fracture toughness and/or 'critical thickness' were not taken into account, but the case proved adequate. In the second example, a design based on the success of the first case proved inadequate because of an increase in section thickness. In the third example, the 'critical thickness' was properly considered and no brittle failure problem arose. After the discussion of these histories, a simplified technique for obtaining the critical thickness data required for adequate design is presented. (Author)

AD-614 111 Div. 27, 25
CFSTI Prices: HC$3.00 MF$0.75

Brown Engineering Co., Inc., Huntsville, Ala., Research Labs.
PARTICLE GROWTH IN THE IONIC NUCLEATION CONDENSATION COLLOIDAL ION SOURCE,
by A. Lucile Cox. Mar 65, 76p
Technical note R-139
Unclassified report

Descriptors: (*Ion engines, Particle beams), (*Colloids, Particle beams), (*Ion sources, Colloids), Electric propulsion, Condensation, Nucleation, Nozzles, Absorption, Cooling, Cadmium, Hydrogen, Thermodynamics, Dynamics, Energy.

This analytical treatment of the ionic nucleation condensation colloidal ion source examines the processes involved in the formation and growth of ionic nuclei under controlled conditions. The analysis of the condensation nuclei considers the formation of neutral nuclei, which must be prevented, and the formation of the required ionic nuclei. Several theoretical concepts of nucleation are examined. Since the growth of the nuclei to colloids of a size suitable for use in electrostatic propulsion engines involves a considerable release of heat, the growth process is analyzed on the basis of three different models for the dissipation of the heat of condensation. The conditions and resultant properties are calculated for a mixed propellant flow of cadmium and hydrogen on the basis of these three models. (Author)

AD-614 201 Div. 27, 10

Polytechnic Inst. of Brooklyn, N. Y.
SHOCK-WAVE PROPAGATION IN LIQUID PROPELLANT ROCKET ENGINES.
Doctoral thesis,
by Vito D. Agosta and Wallace Chinitz. 1961, 19p
Contract AF49 638 165
AFOSR 65-0565 Unclassified report

Pub. in Pyrodynamics v1 p299-317 1964(Copies available only to DDC users). Prepared in cooperation with General Applied Science Labs., Inc., N. Y.
Presented at the National Meeting of the American Institute of Chemical Engineers (49th) New Orleans, March 1963.

Descriptors: (*Rocket motors (Liquid propellant), Shock waves), (*Shock waves, Propagation), Combustion chambers, Equations, Drag, Liquid rocket propellants, Combustion, Drops, Jet engine fuels.

A model is presented for longitudinal shock-wave propagation in liquid propellant rocket engines. The equations, which include the effects of gaseous dissociation, contain appropriate terms to account for the drag, possible shattering, evaporation, and subsequent combustion of the liquid fuel drops. The equations are solved numerically on a digital computer. A comparison of the results obtained with previous experimental work performed in a shock tube indicates good agreement for shock-wave pressure ratios above about 3.5. (Author)

AD-614 260 Div. 27, 14
CFSTI Prices: HC$1.00 MF$0.50

Naval Ordnance Test Station, China Lake, Calif.
CHAR DEPTH IN NOZZLE INSERTS,
by Elder H. Bartel. Jan 65, 25p NOTS TP-3548
NAVWEPS 8539

Unclassified report

Descriptors: (*Nozzle inserts, Laminated plastics), (*Laminated plastics), Nozzle inserts), (*Glass textiles, Reinforcing materials), Rocket motors (Solid propellant), Molding, Erosion, Quartz, Silicon compounds, Dioxides, Fibers, Performance (Engineering), Degradation, Captive tests, Heat-resistant plastics, Phenolic plastics, Epoxy plastics, Additives.

Fiber-reinforced plastic moldings were tested as nozzle inserts in a solid-propellant rocket motor. Results obtained are tabulated and discussed as to erosion resistance and char-forming characteristics of the materials tested. (Author)

AD-614 279 Div. 27, 9, 12
CFSTI Prices: HC$3.00 MF$0.75

Naval Ordnance Test Station, China Lake, Calif.
AN EXPERIMENTAL INVESTIGATION OF THE FLOW PHENOMENA INVOLVED IN GASEOUS THRUST DIRECTION CONTROL DEVICES.
Rept. for Jul 61-Nov 63,
by F. G. Buffum, Jr., E. W. Price, and R. O. Slates.
Oct 64, 75p Rept. no. NOTS-TP-3642
NAVWEPS 8615

Unclassified report

Presented at the U. S. Navy Symposium on Aeroballistics held at the David Taylor Model Basin, (6th) Washington, D. C. 31 Oct-1 Nov 63.

Descriptors: (*Thrust vector control systems, Rockets), (*Secondary injection, Gas flow), (*Gas flow, Thrust vector control systems), Rocket motor nozzles, Jet mixing flow, Turbulent boundary layer, Flow visualization, Gas analysis, Test equipment, Pressure, Guidance, Jets.

The goals of the investigation were to visualize the interaction at the injection point, determine the extent of secondary jet penetration into the main stream, gather data on the wall pressure distribution, and from the data to develop a model for the interaction amenable to analytical treatment.

28. Psychology and Human Engineering

AD-613 949 Div. 28
CFSTI Prices: HC$3.00 MF$0.75

Engineering Psychology Lab., Univ. of Michigan, Ann Arbor.
HUMAN PROCESSING OF EQUIVOCAL INFORMATION.
Final rept.,
by Ward Edwards. Apr 65, 81p Rept. no. 3780-23-F
Contract AF19 604 7393, Proj. 4690, Task 469003
ESD TDR-64-601

Unclassified report

Descriptors: (*Decision making, Probability), (*Probability, Decision making), Human engineering, Game theory, Reliability, Statistical analysis, Analysis of variance, Performance (Human), Theorems, Display systems, Test methods, Design.

This report contains a series of studies investigating the abilities of subjects to revise probability estimates on the basis of new information. These studies show that subjects' probability estimates are reliable, but deviate considerably from posterior probabilities calculated from Bayes's theorem. These deviations are almost always in the conservative direction, i. e., low Bayesian probabilities are overestimated, and high ones are underestimated. Only when each datum is very ambiguous do subjects' estimates become more extreme than Bayesian probabilities. Further, when subjects are asked to give 90% or 50% credible intervals of a posterior probability distribution, their estimates are wider than Bayesian credible intervals. This finding of conservatism has led to the design of a man-computer system that should minimize the effects of human shortcomings in making diagnoses. (Author)

AD-613 954 Div. 28
CFSTI Prices: HC$4.00 MF$1.00

Army Infantry Human Research Unit, Fort Benning, Ga.
SOME DETERMINANTS OF SMALL-GROUP EFFECTIVENESS.
Revised ed.,
by Clay E. George. Oct 62, 124p
HumRRO RM-26

Unclassified report

Revision of rept. dated May 62.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Group dynamics, Behavior), (*Behavior, Group dynamics), Effectiveness, Leadership, Personality, Stress (Psychology), Performance (Human), Motivation, Social communication, Military personnel, Social psychology, Sociometrics, Correlation techniques.

An attempt is made to derive from the literature on small groups some notion of the variables underlying the effectiveness of groups in resolving complex and difficult problems. Major emphasis is placed on studies published between 1955 and 1962. In addition to problem type and recency, studies were given priority for inclusion when they were concerned with groups of young, adult males. Five Sections comprise the body of the paper. The first three deal with background material, the last two with group structure and process per se. The role of cognitive variables in group performance is considered in Section I; the problem of group code orientations is taken up in Section II. Group motivation and behavior under pressure are discussed in Section III. Finally, in Sections IV and V, these variables are considered from the standpoint of their interactions with such group process variables as code formation, social power, information flow, and conformity, and with such structural variables as clique hierarchies, cohesion, formal status and leadership, and communication networks.

AD-614 014 Div. 28, 23
CFSTI Prices: HC$1.00 MF$0.50

Pittsburgh Univ., Pa.
PROGRAMMING METHOD AND RESPONSE MODE IN A VISUAL ORAL TASK.
Final rept. for Oct 61-Oct 63,
by Attila P. Csanyi, Robert Glaser, and James H. Reynolds. Dec 64, 21p
Contracts AF33 616 7175, OE2 10 057,
Proj. 1710, Task 171007
AMRL TR-64-129

Unclassified report

Descriptors: (*Training devices, Teaching machines), (*Learning, Teaching machines), Training, Performance (Human), Conditioned reflex, Achievement tests, Language, Verbal behavior, Punched cards, Retention.

Programming methods and response modes were investigated to determine effective training methods. The identification and pronunciation of phonetic symbols were taught by two different programing methods and two different response modes. The programing method featured either prompting or confirmation, and the response mode was either overt or covert. Achievement was measured on both a multiple choice test and a test requiring overt oral responses. Considerable variation occurred among the test scores for each learning condition. Differences among the conditions, tending to indicate the superiority of overt responding and of confirmation, were significant on only one case. Overt responding was superior for retention when measured by tests requiring overt oral responses. The prompting method coupled with the covert response mode tended to produce poorer learning and retention than the other conditions, but it required only 30 to 50 percent as much learning time as the other conditions. (Author)

AD-614 134 Div. 28, 12
CFSTI Prices: HC$2.00 MF$0.50

Valley Forge Space Technology Center, Philadelphia, Pa.
THE QUANTIFICATION OF HUMAN RELIABILITY. A FEASIBILITY DEMONSTRATION.
Technical information series,
by Allan M. Stave. Mar 65, 43p Rept. no. 65SD216

Unclassified report

Descriptors: (*Errors, Probability), (*Performance (Human), Reliability), Launching, Handling, Malfunctions, Corrections, Decision making, Quality control, Mathematical analysis, Performance tests.

The purpose of this study was to demonstrate a method of calculating the probability of human errors during prelaunch testing. Completion of studies described herein will permit the following statements: (a) The probability that the test can be completed without human error, (b) The probability that human errors will remain undiscovered, (c) The probability that undiscovered errors will result in failures. In addition to a reliability number for the total test, such studies will provide a breakdown of reliabilities for all human tasks in the test. Areas of greatest risk can then be pinpointed and corrective efforts

focused on them. A proposed method for calculating system reliability is described. Development and application of this method will permit assessment of the contribution of each preflight test to over-all system reliability, and will also point out the need for adding or removing tests. This method takes into account the probabilities: (a) that the hardware was manufactured correctly, (b) that the hardware will not be damaged by human handling, (c) that the tests administered to the hardware will reveal all malfunctions, and (d) the inherent reliability of the hardware. Reliability thus determined would be a function of the following: R = f (CI) where R = reliability, C = confidence, and I = inherent reliability. (Author)

AD-614 147 Div. 28, 25

Dartmouth Coll., Hanover, N. H.
SEMANTIC COMPONENTS OF THE QUALITY OF PROCESSED SPEECH,
by Victor E. McGee. 19 Jun 64, 15p
Contract Nonr389705
Unclassified report

Pub. in Journal of Speech and Hearing Research v7 n4 p310-23 1964
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Speech, Intelligibility), (*Speech recognition, Auditory perception), (*Auditory perception, Speech recognition), Speech representation, Frequency, Distortion, Hearing, Acoustic properties, Voice communication systems, Sound pitch, Psychoacoustics.

Fifteen frequency distortions of one male voice were arranged on tape for paired-comparison presentation. Adult male and female listeners made quality-preference judgments and in addition rated each distortion on 30 semantic-differential scales. A paired comparison scale of quality was determined and each of the SD scales was factored by means of an Eckart-Young type of procedure. This procedure proved sensitive to different points of view among the listeners, even when the differences concerned only one or two of the voice distortions. Results indicated that the semantic space for the distortions was two-dimensional, containing in Intelligibility Factor and a Naturalness Factor, and that the prediction of the quality scale required consideration of both of these factors. (Author)

AD-614 243 Div. 28, 1
CFSTI Prices: HC$3.00 MF$0.75

North American Aviation, Inc., Columbus, Ohio.
EFFECTS OF TASK LOADING ON PILOT PERFORMANCE DURING SIMULATED LOW-ALTITUDE HIGH-SPEED FLIGHT,
by Stanley M. Soliday. Feb 65, 93p
Contract DA44 177AMC66T, Proj. 1D131201D159
TRECOM TR-64-69
Unclassified report

Descriptors: (*Performance (Human), Flight simulators), (*Pilots, Performance tests), (*Flight, Low altitude), Reaction (Psychology), Reflexes, Analysis of variance, Learning, Fatigue (Physiology), Job analysis, Airspeed, Terrain, Navigation, Control systems, Jet planes, Instrument panels, Acceleration tolerance, Analog computers.

The effects of task loading on pilot performance during simulated low-altitude, high-speed flight were studied. Approximately 210 hours of flight were made by experienced pilots in a moving-base simulator that had a total vertical travel of 12 feet and an acceleration capability of ± 6G. The flights were made over several types of terrain at several airspeeds under different conditions of navigation task and emergency task loading. Medium-heavy turbulence was simulated for all flights. Data were analyzed in terms of human performance aspects of the missions. (Author)

AD-614 338 Div. 28

Columbia Univ., New York.
THE BISECTION OF A VISUAL EXTENT,
by James Russell Nazzaro. 7 Aug 62, 12p
Unclassified report

Pub. in American Journal of Psychology v77 p403-13 Sep 1964 (Copies not available to DDC or Clearinghouse customers).
Research supported by Office of Naval Research, Washington, D. C.

Descriptors: (*Space perception, Separation), Visual acuity, Brightness, Thresholds (Physiology), Illumination, Errors.

The problem of the study was to determine the variable and absolute error of the bisection of perceptual space made under conditions well above the discriminative thresholds of acuity and brightness. The parameters varied were luminance, visual area, and separation of the fiducial or standard lines of reference demarcating the visual area. The data were analyzed in terms of Hecht's equations for brightness-discrimination. (Author)

AD-614 363 Div. 28, 15

Columbia Univ., New York.
VISUAL SPACE: A TEST OF THE CONSTANT CURVATURE HYPOTHESIS,
by John M. Foley. 1958, 2p
Unclassified report

Pub. in Psychonomic Science (U.S.) v1 p9-10 1964
(Copies not available to DDC or Clearinghouse customers)
Supported in part by ONR.

Descriptors: (*Space perception, Geometric forms), (*Curved profiles, Tests), Vision, Projective geometry, Theory.

The Desarguesian property an implication of the constant curvature hypothesis was submitted to experimental test. This property requires that if two vertices of a triangle are joined by segments to the opposite sides these segments intersect. The results indicate that the property does hold for a significant portion of observers; others may be slightly non-Desarguesian. (Author)

AD-614 364 Div. 28, 16, 25

Columbia Univ., New York.
DESARGUESIAN PROPERTY IN VISUAL SPACE,
by John M. Foley. 20 Nov 63, 10p
Unclassified report

Pub. in Journal of the Optical Society of America v54 n5 p684-92 May 1964 (Copies not available to DDC or Clearinghouse customers).
Research supported in part by Office of Naval Research, Washington, D. C.

Descriptors: (*Projective geometry, Visual perception), (*Visual perception, Projective geometry), Light, Space perception, Psychomotor tests, Optics.

The Luneburg theory states that the visual space can

be represented by one of the Riemannian spaces of constant curvature. This implies that the visual space is Desarguesian. The Desarguesian property may be stated as follows: If two vertices of a triangle are jointed by segments to the opposite sides, these segments intersect. This proposition was tested by having observers move small lights so as to construct apparent segments on a given triangle. Six such experiments were performed using two triangles and five observers. In all cases the minimum physical distance between the two curves determined by the average settings of the lights was between 20 and 220 sec. In two of the six cases this distance was not significantly different from zero. Four determinations of the threshold for discriminating the nonintersection of two segments yielded values in the range of 59 to 92 sec. It was concluded that the visual spaces of a significant proportion of the observers are Desarguesian; those of others may be non-Desarguesian. (Author)

AD-614 449 Div. 28
CFSTI Prices: HC$1.00 MF$0.50

Research Center for Group Dynamics, Univ. of Michigan, Ann Arbor.
GROUP SUCCESS AND THE REDUCTION OF STATUS INCONGRUENCE IN TASK-ORIENTED GROUPS,
by Eugene Brunstein and Tobert B. Zajonc. 15 Apr 65, 25p Technical rept. no. TR-31
Contract Nonr 122434, Proj. NR170 809
Unclassified report

Descriptors: (*Group dynamics, Performance (Human)), Social psychology, Sociometrics, Reaction (Psychology), Reflexes, Psychometrics, Perception (Psychology), Control.

Considered in this paper are tendencies toward hierarchical restructuring which arise from status incongruence in task-oriented groups with different histories of success. Each group consists of four members who differ in (a) their apparent task ability, i.e., performance status, and (b) their influence over the overall group product, i.e., control status. In particular, over a large number of task trials changes in control status are observed under various conditions of status incongruence, in groups with histories of relatively high and low success. Each group begins with a perfect congruence between performance status and control status. Experimental manipulations are subsequently performed which induce discrepancies between these two sources of status. In half of the groups performance status of the member with the highest control status is reduced, and in the other half performance status of the member with the lowest control status is increased. Both of these experimental inductions necessarily result in a systematic deterioration of the total group output. Observations are made over a large number of trials to determine how rapidly groups of individuals respond and adapt to status incongruence of the above two forms, and how these responses are influenced by the past task successes and failures of the group. (Author)

AD-614 532 Div. 28, 16

Indiana Univ., Bloomington.
ELECTROPHYSIOLOGICAL EFFECTS OF THE INTERACTION BETWEEN TASK DEMANDS AND SENSORY INPUT,
by Robert M. Stern. 6 Apr 64, 10p
Contract Nonr90815
Unclassified report

Pub. in Canadian Journal of Psychology/Revision Canadian Psychology v18 n4 p311-20 1964
(Copies available only to DDC users).

Descriptors: (*Sensory deprivation, Performance (Human)), Autonomic nervous system, Musculoskeletal system, Sensory perception, Relaxation (Physiology), Electrocardiography, Galvanic skin response, Respiration, Attention, Behavior, Psychophysiology, Analysis of variance.

The purpose of this study was to investigate the effects of reduced sensory input on two task conditions. The effects were measured in terms of the electrophysiological activity of the autonomic nervous system and the skeletal muscle system. A Vigil group reported the 'movements' of an autokinetic light; a Rest group simply relaxed. The autonomic indices revealed significantly higher activity for the Vigil Group, thus supporting Duffy and Malmo's hypothesis concerning the importance of task demands in determining level of physiological activity. (Author)

AD-614 562 Div. 28, 23

Walter Reed Army Inst. of Research, Washington, D. C.
MODES OF COMMUNICATION USED BY MILITARY PATIENTS DIAGNOSED AS SCHIZOPHRENIC (ACUTE), AS ALCOHOLIC (CHRONIC) AND BY MILITARY OFFENDERS (AWOL),
by Kenneth L. Artiss, Harold S. Kolmer, Jr. and Lewis Kurke. 1962, 6p
Unclassified report

Pub. in Disorders of Communication v42 p367-72 Chap24.
Copies not available to DDC or Clearinghouse customers.

Descriptors: (*Military psychology, Military personnel), (*Military personnel, Abnormal psychology), Adjustment (Psychology), Addiction, Behavior, Personality, Mental disorders, Attitudes, Social communication, Therapy.

29. Quartermaster Equipment and Supplies

AD-613 950 Div. 29, 20
CFSTI Prices: HC$3.00 MF$0.75

Army Natick Labs., Mass.
INDUCED RADIOACTIVITY IN FOOD AND ELECTRON STERILIZATION,
by Richard A. Meyer. Apr 65, 62p
Technical rept. no. FD-6
Proj. 1C0 25601A033

Unclassified report

Descriptors: (*Irradiated foods, Artificial radioactivity), (*Radiation hazards, Irradiated foods), Radioactivity, Food, Purification, Electrons, Containers, Radioactive isotopes, Handling, Neutron flux, Nuclear isomers, Radiological dosage, Packaging, Aluminum, Plastics, Tritium.

Food irradiated with 24 MeV electrons contains less than a fiver percent increase in the radioactivity level over that present before irradiation. A compilation of the experimentally measured amount of activity induced in various foods as a function of initial electron energy is presented in various tables. An equation has been developed which will predict the average amount of induced activity as a function of initial electron energy, dosage, and elemental abundance. This equation yields results within the variation of trace elements in foods. To aid in the use of these equations, tables of trace element composition in various foods are presented. Isomer activity has not been detected in foods even from irradiation with high energy electrons. Only by resorting to pure elemental targets was it possible to set upper limits on the amount of isomer activity that might be produced. From the experimental data compiled, an empirical equation was developed to predict the amount of isomer activity produced in a particular food as a function of initial electron energy and dosage. Although activity induced in cans is not a food consumption problem, the amount of activity present immediately after irradiation can produce a handling problem. It appears that the best solution to this problem may be the use of aluminum cans or an aluminized plastic packaging material. (Author)

30. Research and Research Equipment

AD-613 925 Div. 30, 25
CFSTI Prices: HC$1.00 MF$0.50

Crystal Research Lab., Pennsylvania State Univ., University Park.
RESEARCH, DEVELOPMENT AND APPLICATIONS OF X-RAC, S-FAC AND R-PAC, ELECTRONIC ANALOGUE COMPUTERS FOR X-RAY CRYSTAL ANALYSIS.
Final rept. for 16 Sep 49-15 Sep 61,
by V. Vand. 30 Dec 64, 23p
Contract N6onr26916, Proj. NR018 705
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Analog computers, Crystal structure), (*Crystal structure, Analysis), (*X-ray diffraction analysis, Crystal structure), Digital computers, Symmetry (Crystallography).

Contents:
Brief description of X-RAC and S-FAC
Listing of 12 papers directly connected with the design and operation of the X-RAC and S-FAC computers
Listing of 20 published abstracts to work of R. Pepinsky
Listing of 70 papers concerned with the solution of crystal structures where these computers were used or acknowledged.
Listing of 29 papers concerned with theoretical aspects of X-ray analysis connected with this contract
Listing of 69 progress reports issued under the contract.

AD-613 930 Div. 30, 16
CFSTI Prices: HC$2.00 MF$0.50

Philco Corp., Willow Grove, Pa. Bio-Cybernetics Lab.
A CORRELATIONAL STUDY OF MYOPOTENTIAL RESPONSE AND FORCE OF MUSCLE CONTRACTION DURING VARYING ACTIVITY DEMANDS.
Interim rept.,
by F. Ray Finley and Roy W. Wirta. 17 Mar 65, 32p
Rept. no. 2386
Contract Nonr429200
Unclassified report

Descriptors: (*Bionics, Muscles), (*Muscles, Electrical properties), Contraction, Performance (Human), Computers, Signals, Motion, Cybernetics, Control systems, Potentiometers, Ergometers, Tachometers, Electronic recording systems, Reliability, Force (Mechanics), Programming (Computers).

A major objective of the Philco Bio-Cybernetics Engineering activity has been to develop an optimum degree of compatibility between man and the machines which he used to augment his performance capacity. One phase of study, in the pursuit of this objective, has been developed about a hypothesis that the myoelectric activity associated with muscular contraction could be utilized to control a powered exo-skeletal system designed to amplify one's strength. This phase of study is the subject of this interim report.

AD-613 946 Div. 30
CFSTI Prices: HC$4.00 MF$1.00

Measurement Analysis Corp., Los Angeles, Calif.
TRANSDUCERS FOR SONIC FATIGUE MEASUREMENTS,
by Ronald D. Kelly. Feb 65, 120p MAC-403-01
Contract AF33 615 1314, Proj. 4437, Task 443706
FDL TR-64-171
Unclassified report

Descriptors: (*Transducers, Errors), (*Sonic fatigue, Measurement), (*Microphones, Errors), (*Strain gages, Errors), (*Accelerometers, Errors), Piezoelectric transducers, Signal generators, Electric cables, Performance (Engineering).

The report discusses the machine errors of transducer systems used for the measurement of dynamic input and response data during sonic fatigue testing. The specific types of transducers covered are accelerometers, microphones, and strain gages. The basic operating principles, intrinsic inaccuracies, environmentally related inaccuracies, and usage inaccuracies are described. These inaccuracies are broken down into errors occurring in the transducer, cabling, and signal conditioner, as well as those due to system operation. In addition, methods for minimizing these errors are given. (Author)

AD-613 966 Div. 30, 4, 25
CFSTI Prices: HC$1.00 MF$0.50

Group for the Advancement of Spectroscopic Methods, Paris (France).
RESEARCH ON BASIC FAR-INFRARED TECHNIQUES.
Final scientific rept. for 15 Dec 62-20 Dec 64,
by A. Hadni and J. Lecomte. 20 Jan 65, 14p
Contract AF61 052 662
AFCRL 65-204
Unclassified report

Descriptors: (*Infrared spectroscopy, Reviews), Ions, Electron transitions, Ruby, Praseodymium compounds, Samarium compounds, Chlorides, Absorption spectrum, Electric arcs, Semiconductors, Germanium, Gallium, Amplifiers, Power supplies.

Work in the following areas is summarized: the possibility of far-infrared electronic transitions in ions and pairs of ions, the absorption spectra of polar and non polar molecules in the liquid state, the far-infrared emission of the high pressure mercury arc, the design of a far-infrared detector with a gallium doped germanium, and construction of high accuracy low and high voltage supplies for a low noise, low frequency amplifier. A bibliography of published papers generated under the contract is included.

AD-613 976 Div. 30
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
PROGRAMMING BY QUESTIONNAIRE,
by Allen S. Ginsberg, Harry M. Markowitz, and Paula M. Oldfather. Apr 65, 48p Rept. no. RM-4460-PR
Contract AF49 638 700
Unclassified report

Descriptors: (*Programming (Computers), Preparation), Simulation, Job analysis.

The approach is to present the user with a set of possible options, expressed in an English language questionnaire. By choosing from these options, the user specifies all the information necessary to construct his desired computer program. A 'Generator' program, informed of the selected options, then constructs the desired program and specifies the data that the user must supply in order to execute the generated program. The components of the Generator program are: (1) A 'Statement List' that includes all the com-

mands which may be needed in the construction of any of the programs. (2) A set of 'Decision Tables' that specify which commands are to be included in the generated program, based on the choices selected from the Questionnaire. (3) An 'Editor' that processes the Questionnaire, Statement List, and Decision Tables. The mechanics of the program generation process are discussed in terms of an illustrative Job Shop Simulator Program Generator (JSSPG).

AD-613 983 Div. 30, 25
CFSTI Prices: HC$2.00 MF$0.50

General Dynamics, Fort Worth, Tex.
COMPUTER CODES FOR REACTOR AND HAZARD ANALYSES AT NARF.
Final rept. for 1 Oct 63-30 Sep 64,
by J. W. McWhirter. Mar 65, 35p FZK-211
Contract AF29 601 6213, Proj. 6773, Task 677302
WL TR-64-138
Unclassified report

Descriptors: (*Nuclear reactors, Program (Computers)), (*Programming (Computers), Nuclear reactors), (*Radiation hazards, Programming (Computers)), Reactor kinetics, Neutron transport theory, Heat transfer.

A number of computer codes obtained from other facilities have been modified for computer utilization at the Nuclear Aerospace Research Facility (NARF). The following codes are presently operational and are, therefore, part of the NARF's reactor and hazard analysis capability: (1) RISC, Radiological Inhalation Safety Code; (2) AIREK-III, Reactor Kinetics Code; (3) FAIM, One-Dimensional Multigroup Neutron Diffusion Code; (4) 9-ANGIE; Two-Dimensional Multigroup Neutron Diffusion Code; (5) MLFTHAN, Heat-Transfer Code; (6) DTK, One-Dimensional Multigroup Neutron Transport Code; and (7) DDK, Two-Dimensional Multigroup Neutron Transport Code. This report briefly describes the characteristics of these codes to indicate the services available at NARF. (Author)

AD-614 006 Div. 30
CFSTI Prices: HC$6.00 MF$1.50

Illinois Univ., Urbana. Engineering Experiment Station.
COGNITRON THEORY,
by Ronald J. Swallow. Jun 64, 251p
Grant AF AFOSR7 63
AFOSR 65-0582
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Artificial intelligence, Theory), Nerve cells, Simulation, Sense organs, Sensory mechanisms, Conditioned reflex, Matrix algebra, Mapping (Transformations), Mathematical models, Feedback, Bionics.

The Cognitron is a net of artificial neurons, sensory neurons, and muscles whose properties were chosen with the intent that they conform to a diversified amount of physiological and psychological data. This paper rigorously analyzes the behavior of small nets of its artificial elements in order to indicate some of the similarity between their behavior and human mental behavior. Results indicate that the conditioned reflex-like activity of these small nets is reinforced to a degree dependent on a property of the nets closely resembling one's intuitive idea of the 'newness' of the nets' input and internal pulse states. It is suggested that the newness is the rewarding property governing reinforcement in the animal mind and that this reinforcement property generalizes the rewarding and punishing effects of food and pain stimuli, respectively so as to include the rewarding effects of 'new' environments. It is also suggested that chain conditioned reflex activity in the animal does not exceed a few steps because the response becomes 'old', loses its rewarding effects, and thus prevents any further conditioned reflex activity which involves that particular response. (Author)

AD-614 010 Div. 30, 8
CFSTI Prices: HC$3.00 MF$0.75

Catholic Univ. of America, Washington, D. C.
RESEARCH ON THE APPLICATION OF FERRO-AND FERRIELECTRIC PHENOMENA IN COMPUTER DEVICES.
Final rept. for Aug 62-Oct 64,
by Charles F. Pulvari. Feb 65, 77p
Contract AF33 657 8871, Proj. 4160, Task 416004
RADC TR-64-529 Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Ferroelectric crystals, Computer logic), (*Computer logic, Ferroelectric crystals), (*Computer storage devices, Ferroelectric crystals), (*Bismuth compounds, Oxides), Dielectrics, Switching circuits, Capacitors, Polarization, Ferroelectric materials, Computers.

The objective of this research was to demonstrate that capacitor elements composed of ferrielectrics of the MBO type employed as a dielectric represent an important improvement as compared to ordinary ferroelectric capacitors and that they can be utilized as a logic and memory device. Fabrication techniques of these ferrielectric devices are discussed with a special emphasis on the preparation of uniformity when large quantities of such devices are fabricated. The development of field controlled polarization transfer devices (Transpolarizers) continued utilizing uniform quality ferrielectric crystals as a dielectric. The development of various logic circuits is presented and for the first time a half adder was successfully operated utilizing capacitors exhibiting ferroelectric properties as switching elements. A small section of a random access memory was constructed and investigated utilizing ferrielectric transpolarizers. (Author)

AD-614 020 Div. 30
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
THERMOANEMOMETER WITH DC FEEDBACK,
by G. F. Appolonov. 26 Mar 65, 10p
FTD-TT-64-1043
TT 65-61992
Unclassified report

Unedited rough draft trans. of Politekhnicheskii Institut, Leningrad. Trudy (USSR) n217 p176-9 1961.

Descriptors: (*Flow meters, Fluid mechanics), Gas flow, Velocity, Thermocouples, Electron tube heaters, Direct current, USSR, Feedback amplifiers.

A brief description is given of a thermoanemometer which measures the mean velocity of air flow (up to 120 m/sec) and velocity pulsation intensity up to 10,000 c,. Compensation of thermal inertia of the filament is realized with the aid of a feedback amplifier, which makes a corresponding current regulation of filament heating current and automatically maintains the re-

sistance of this filament. The instrument has a special amplifier, rectifying the non-linear dependence of the signal upon the rate of flow coming from the filament. Measurement of mean square root values of velocity pulsation is made with the aid of a pulsation amplifier, vacuum thermocouple, and thermo EMF amplifier.

AD-614 022 Div. 30, 26
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
A SELF-ADJUSTING SYSTEM,
by M. L. Bykhovskii, M. I. Breido, A. I. Korendyasev, A. E. Kobrinskii, and E. I. Levkovskii. 26 Mar 65, 6p FTD-TT-64-1285
TT 65-61994 Unclassified report

Unedited rough draft trans. of Russian patent 156822, appl. 640791/25, subscription group no. 212.

Descriptors: (*Cutting tools, Control systems), (*Machine tools, Control systems), (*Programming (Computers), Integrators), (*Integrators, Programming (Computers)), Automation, Computer storage devices, USSR, Patents.

Object of Invention: The self-adjusting system of programmed control of metal-cutting machine tools with the use of a 4-register magnetic drum as the operative memory unit is distinguished by the fact that in order to obtain an improved program by means of algebraic summation of the calculated program with the results of the measurements of the finished profile of the part obtained with regard to the current program, an integrator is used in the system for statistical treatment of the results of measurements supplied to the arithmetic device and neutralizer. (Author)

AD-614 030 Div. 30
CFSTI Prices: HC$3.00 MF$0.75

RAND Corp., Santa Monica, Calif.
THE COST OF BASIC RESEARCH EFFORT: AIR FORCE EXPERIENCE, 1954-1964,
by E. D. Brunner. Feb 65, 60p
Rept. no. RM-4250-PR
Contract AF49 638 700 Unclassified report

Descriptors: (*Air force research, Costs), (*Scientific research, Air force budgets), Research program administration, Department of Defense, Scientific personnel, Wages, Industries, Universities, Management planning.

The costs of basic scientific research supported by the U. S. Air Force Office of Aerospace Research from Fiscal Year 1954 through Fiscal Year 1964 are discussed. Costs are defined to include not only the compensation of scientists, but outlays, and all other items requisite to the performance of research. The results of the study are applicable only to the operations of AFOAR's Office of Scientific Research. The possible use of the materials developed in this study for AFOSR planning and budgeting activities is illustrated in the final section of the Memorandum. The information on the costs and their trends for engineering sciences is employed to estimate the funding levels requisite for three specified levels of effort during the period extending from FY 1965 through FY 1969.

AD-614 032 Div. 30, 2, 6, 12
CFSTI Prices: HC$11.25 MF$3.75

Institute of Science and Tech., Univ. of Michigan, Ann Arbor.
PROCEEDINGS OF THE SYMPOSIUM ON REMOTE SENSING OF ENVIRONMENT (3RD), 14-16 OCTOBER 1964.
Feb 65, 822p Rept. no. 4864-9-X
Contract Nonr122444
Unclassified report

Descriptors: (*Space probes, Instrumentation), (*Atmospheric sounding, Instrumentation), (*Monitors, Remote control systems), (*Remote control systems, Monitors), (*Symposia, Monitors), Lunar environment, Mapping, Venus probes, Manned spacecraft, Radar scanning, Acoustic equipment, Infrared equipment, Meteorological satellites, Lasers, Probes (Electromagnetic), Photogeology, Radar equipment, Geology, Meteorology, Oceanology, Reports.

The program consisted of 52 papers treating applications for remote sensing in space programs; atmospheric research and meteorology; geology and geography; vegetation, forestry, and agricultural studies; and oceanography; as well as treating methods of handling and interpreting data from electromagnetic, acoustical, and force sensors employed in these various roles.

AD-614 033 Div. 30, 8

Space Sciences Lab., General Electric Co., Philadelphia, Pa.
DIGITAL FILTERS FOR DATA PROCESSING,
by Marcel A. Martin. Oct 62, 150p
Technical Information Series no. 62SD484
Contracts AF04 647 269, AF04 647 617
Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Filters (Electromagnetic wave), Data processing systems), (*Data processing systems, Filters (Electromagnetic wave)), Functions, Communication theory, Fourier analysis, Least squares method, Numerical analysis, Sampling, Computer logic.

The notions of frequency domain and transfer function have proved to be very useful in the understanding and in the design of digital filters for use in data processing. Preliminary results have been reported in TIS 57SD340. Investigations carried out by the author since that time are summarized here. General methods for designing a variety of filters of specified transfer functions were developed. Performance of several classical methods (Fourier analysis, least square polynomial fit, Lagrange interpolation formula) applied to sampled data was evaluated. Various types of filters, low-pass filters, differentiators, interpolation filters and filters for spectral analysis are analyzed in successive chapters. The last chapter is devoted to a discussion of some of the uses of these filters in data processing, as well as of the precautions to take and limitations to expect. A brief description of the min-max technique, which permits to obtain linear combinations of specified functions to approximate in the Chebyshev sense some specified real or complex functions, is given in the Appendix. (Author)

AD-614 034 Div. 30, 14

Naval Ordnance Test Station, China Lake, Calif.
A NEW METHOD FOR RAPID MEASUREMENT OF THERMAL DIFFUSIVITY AT ELEVATED TEMPERATURES WITH AN APPLICATION TO A SANDWICH STRUCTURE,
by Warren K. Smith. 25 Aug 59, 8p
Technical note no. TN-4061-31
Unclassified report

Available only for reference use at DDC field Services. Copy is not available for public sale.

Descriptors: (*Thermal diffusion, Test methods), (*Sandwich panels, Thermal diffusion), Thermal properties, Measurement, Aerodynamic heating, Test equipment, Radiant heating panels, High-temperature research.

The radiant heating facility recently installed at NOTS has been found useful for rapidly determining thermal properties of materials at elevated temperatures. Complicated guard heaters and careful insulation are unnecessary. This method was applied to a speciment of 'Spacemetal' sandwich material with results in close agreement with those obtained by more conventional methods.

AD-614 042 Div. 30, 5, 8, 25, 32
CFSTI Prices: HC$6.00 MF$1.50

Lockheed Missiles and Space Co., Palo Alto, Calif.
TECHNICAL PROGRESS ON FUNDAMENTAL AND APPLIED RESEARCH PROGRAMS.
Progress rept. for Jan-Mar 65.
Mar 65, 293p Rept. no. 6-75-65-10
Unclassified report

Descriptors: (*Lasers, Scientific research), (*Documentation, Scientific research), (*Electronics, Scientific research), (*Physics, Scientific research), Reports, Electrons, Scattering, Plasma physics, Electromagnetic waves, Propagation, Solid state physics, Cesium, Crystals, Excitation, Semiconductors, Spectroscopy, Quantum mechanics, Magnetic materials, Ferromagnetic materials, Superconductivity, Magnetic tape, Liquids, Information retrieval, Storage tubes, Display systems, Electronics laboratories, Communication theory.

Contents: Physical electronics, Solid state physics, Liquid state physics, Information sciences, Lasers and communication theory.

AD-614 073 Div. 30, 15, 32
CFSTI Prices: HC$1.00 MF$0.50

System Development Corp., Santa Monica, Calif.
PRESERVATION OF UNAMBIGUITY AND INHERENT AMBIGUITY IN CONTEXT FREE LANGUAGES.
Technical memo.,
by Seymour Ginsburg and Joseph Ullian. 12 Jan 65,
16p Scientific rept. no. SR-2, TM-738/011/00
Contract AF19 628 3418, Proj, 5632, Task 563205
AFCRL 65-178
Unclassified report

See also AD-613 290.

Descriptors: (*Languages, Data processing systems), Programming languages, Set theory, Mathematical logic, Algebras.

Various elementary operations are studied to find whether they preserve unambiguity and inherent ambiguity of languages ('language' means 'context free language'). The following results are established: (1) If L is an unambiguous language and S is a generalized sequential machine then (a) S(L) is an unambiguous language if S is one-to-one on L, and (b) S(-1)(L) is an unambiguous language. (2) Inherent ambiguity is preserved by every generalized sequential machine which is one-to-one on the set of all words. (3) The product (either left or right) of a language and a word preserves both unambiguity and inherent ambiguity. (4) Neither unambiguity nor inherent ambiguity is preserved by any of the following language-preserving operations: (a) one-state complete sequential machine; (b) product by a two-element set; (c) Init(L) = (u is not equal to E/uv in L for some v); (d) Subw(L) = (w is not equal to E/uwv in L for some u, v). (Author)

AD-614 095 Div. 30, 13, 17
CFSTI Prices: HC$1.00 MF$0.50

Army Materials Research Agency, Watertown, Mass.
SLOW BEND-TENSION TEST CORRELATIONS OF SHORT BEAMS WITH SPECIAL REFERENCE TO THE CHARPY-TYPE SPECIMEN,
by John Nunes. Dec 64, 24p
Technical rept. no. AMRA TR-64-45
Proj. 1A024401A11002, Task 35225
Unclassified report

Descriptors: (*Beams (Structural), Loading (Mechanics)), (*Test methods, Beams (Structural)), Deformation, Tensile properties, Compressive properties, Stresses, Mathematical analysis, Steel, Low-temperature research, Tests, Data.

The maximum outer-fiber stresses of simply supported rectangular beams subjected to a concentrated load at mid-span for various span-to-depth ratios were determined utilizing the Wilson-Stokes theory. It was found that at the elastic limit of the load-deflection curve, the maximum outer fiber longitudinal compressive stress of the unnotched Charpy specimen correlated well with the uniaxial tension test yield stress data. Also, the yield loads determined from the limit of the linear load-deflection curves of the notched Charpy specimens were found to be essentially equivalent to the unnotched Charpy yield-load data. Finally, it is shown that it is possible to calculate from uniaxial tension test data the maximum bending load of an unnotched centrally loaded, simply supported beam, provided the exponential relationships of stress and strain and the Wilson-Stokes theory are used. (Author)

AD-614 096 Div. 30
CFSTI Prices: HC$6.00 MF$1.50

Office of Aerospace Research, Washington, D. C.
OAR CUMULATIVE INDEX OF RESEARCH RESULTS, 1964.
1964, 282p Rept. no. OAR-65-5
Unclassified report

Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Air force research, Bibliographies), (*Indexes, Air force research), Astronautics, Meteorology, Climatology, Weather forecasting, Propellants, Detection, Guided missiles, Electronics, Solid state physics, Communication systems, Satellites (Artificial), Orbital trajectories, Data processing systems, Radio astronomy, Plasma physics, Physical chemistry, Astrophysics, Radar, Mathematics, Physics, Geodesics, Geology, Spectroscopy, Nuclear physics, Nuclear explosions, Magnetohydrodynamics, Electromagnetism, Materials, Aviation medicine, Research program administration.

The OAR Cumulative Index of Research Results, 1964 is designed: -to identify all technical reports produced and published by the various organizations within the Office of Aerospace Research during the calendar year 1964. -to provide a record of the results of research conducted and sponsored by each OAR organization during this same

period. -to furnish a ready reference for the identification of technical reports produced by particular authors or contractors, or under certain contracts, grants or projects.

AD-614 102 Div. 30, 1, 9
CFSTI Prices: HC$2.00 MF$0.50

Naval Ordnance Lab., White Oak, Md.
PROGRAM FOR THE STABILITY ANALYSIS OF A TOWED BODY.
Technical rept.,
by Elias V. Schuman. 27 Oct 64, 27p
Mathematics department rept. no. M-55, NOLTR-64-139
Proj. 751 0770
Unclassified report

Descriptors: (*Towed bodies, Stability), Aerodynamic characteristics, Programming (Computers), Magnetometers.

Two computer programs are discussed which analyze the stability of a body towed in air. A detailed description of input and output is included. (Author)

AD-614 130 Div. 30, 6, 8, 25
CFSTI Prices: HC$3.00 MF$0.75

Cruft Lab., Harvard Univ., Cambridge, Mass.
VERY LOW FREQUENCY PROPAGATION; ELECTRON AND SOLID STATE PHYSICS; AUTOMATIC CONTROL; COMMUNICATIONS AND NETWORKS; ELECTROMAGNETIC RADIATION.
Semiannual progress rept. no. 67, 1 Jul 63-1 Jan 64,
by J. A. Pierce, N. Bloembergen, and R. W. P. King.
20 Apr 64, 68p
Contract Nonr186607, Nonr186616
Unclassified report

See also AD-434 911.

Descriptors: (*Communication systems, Reviews), (*Radio transmission, Very low frequency), (*Solid state physics, Reviews), (*Control systems, Automatic), (*Electromagnetic radiation, Reviews), Navigation, Masers, Electrons, Crystal lattices, Nuclear spins, Semiconductors, Optical phenomena, Lasers, Nonlinear systems, Programming (Computers), Optimization, Partal differential equations, Networks, Communication theory, Transmitter-receivers, Antennas, Probes (Electromagnetic), Plasma medium, Propagation, Electromagnetic shielding.

Progress and results are summarized for 56 research projects.

AD-614 164 Div. 30, 8

Electronics Research Lab., Univ. of California, Berkeley.
ANALYSIS AND SYNTHESIS OF STABLE LINEAR SEQUENTIAL CIRCUITS,
by Arthur Gill. Aug 64, 9p
Grant AF AFOSR639 64
AFOSR 65-0630
Unclassified report

Pub. in Journal of the Association for Computing Machinery v12 n1 p141-9 Jan 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted Feb 64.

Descriptors: (*Switching circuits, Synthesis), Digital systems, Analysis, Matrix algebra, Topology, Coding, Corrections.

Linear sequential circuits (LSC's) are finding an increasing number of uses in error-correction, computer control, random number generation and other digital applications. The purpose of this paper is to develop analysis and synthesis techniques for the class of autonomous, 'stable' LSC's, which is of special interest in error-correction schemes. Properties of such LSC's are described in terms of their state graphs, and a method is presented for constructing the state graph from the characteristic matrix of a given LSC. Necessary and sufficient conditions are formulated for a given graph to correspond to a realizable stable circuit, and a procedure is given for finding this circuit's characteristic matrix and synthesizing it by means of shift registers. (Author)

AD-614 212 Div. 30, 25

Avco Everett Research Lab., Everett, Mass.
CURRENT DISTRIBUTION IN A MAGNETIC ANNULAR SHOCK TUBE.
Research notes,
by James C. Keck. 22 Jan 62, 2p
Contract AF49 638 659
AFOSR 65-0566
Unclassified report

Pub. in Physics of Fluids v5 n5 p630-1 May 1962
(Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Shock tubes, Magnetohydrodynamics), (*Electric currents, Distribution), Plasma physics, Magnetic fields, Space propulsion.

AD-614 228 Div. 30, 28
CFSTI Prices: HC$4.00 MF$0.75

Moore School of Electrical Engineering, Univ. of Pennsylvania, Philadelphia.
THE EVALUATION OF TECHNIQUES AND DEVICES AS APPLIED TO PROBLEM SOLVING.
Final rept.,
by Morris Rubinoff, J. F. White, Jr., David Loev, and Donald F. Blumberg. Feb 65, 113p
Contract AF30 602 3065, Proj. 4594, Task 459404
RADC TDR-64-402
Unclassified report

Descriptors: (*Artificial intelligence, Decision making), (*Decision making, Humans), Computers, Performance (Human), Game theory, Information retrieval, Mathematical models, Learning, Group dynamics, Personality, Probability.

The problem of forecasting technological change is investigated. Machines and computer programs having 'problem solving' capabilities are examined to determine their usefulness in aiding or replacing the human forecaster. The literature on human problem solving was also reviewed. The following conclusions were reached: (1) the nature of the forecasting problem precludes the use of computer-type problem solvers developed to date, and (2) the application of information science techniques, namely: descriptors representing technological concepts, the forces acting to change the technology and the laws governing the change, appear to offer the most promise in assisting the human forecaster. Accordingly, a quasi-mathematical model was developed using matrix notation to describe a technology. An example of a forecast of computer technology made several years ago is included. (Author)

AD-614 247 Div. 30, 2, 8
CFSTI Prices: HC$1.00 MF$0.50

Stanford Research Inst., Menlo Park, Calif.

DIGITIZING RIOMETER SYSTEM.
Final rept. for 1 Dec 63-28 Feb 65,
by J. C. Hodges and G. L. Johnson. Feb 65, 25p
Contract AF19 628 409, Projs. 8653, 4059
AFCRL 65-154

Unclassified report

Descriptors: (*Extraterrestial radio waves, Monitors), (*Data processing systems, Extraterrestial radio waves), Measurement, Data storage systems, Digital recording systems, Analog-to-digital converters, Paper, Tapes, Magnetic tape, Ionosphere, Absorption, Test equipment.

The prototype of a digitizing riometer system is described. The data are punched into paper tape, which a computer later transfers to digital magnetic tape. The computer then uses the magnetic tape to construct a quiet-day curve. The final computer output is a chart of absorption versus time. (Author)

AD-614 248 Div. 30, 2
CFSTI Prices: HC$3.00 MF$0.75

Technical Operations Research, Burlington, Mass.
RELATIVE ADVANTAGES OF INTERFEROMETER OVER TELESCOPE FOR MEASURING SOURCE SIZES.
Final rept. for 15 Nov 63-31 Jan 65,
by Helmut Hecksher and George O. Reynolds. 5 Mar 65, 94p Rept. no. TO-B-65-19
Contract AF19 628 3871, Proj. 8663; ARPA Order 450, Task 866302
AFCRL 65-179

Unclassified report

Descriptors: (*Interferometers, Astronomical data), (*Telescopes, Astronomical data), Atmospheric motion, Stars, Measurement.

In the report an analysis of the Michelson stellar, Fizeau double-slit and the folding interferometers is given and their relative merits are compared to a telescope for performing source size measurements. The atmospheric effects upon these instruments are examined. Experimental procedures describing the use of the Michelson stellar interferometer are given. Experimental difficulties encountered in the program are also discussed. It is concluded that interferometers are a better instrument than telescopes for source size measurements in the presence of a turbulent atmosphere if information about the source geometry and intensity distribution is available. When the source geometry and intensity distribution are not known, then none of the instruments give an absolute source size measurement under turbulent conditions. (Author)

AD-614 257 Div. 30, 32

National Bureau of Standards, Washington, D. C.
PLACEBO IV, RULES, CONCORDANCE, SAMPLE COMPUTER GENERATION,
by William C. Watt. 9 Mar 65, 69p
Technical note no. TN-255

Unclassified report

Available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.45, as C13.46:255.

Descriptors: (*Programming (Computers), Language), Programming languages, Artificial intelligence, Computers, Analysis.

This paper presents materials which make the micrograrmar PLACEBO IV accessible to close inspection. In the form given here, the micrograrmar (when transferred to punched cards and when allied with the requisite 'service programs') may be used for random generation as well as, with minor modifications, for analytical parsing. These materials also facilitate the conversion of PLACEBO IV to the production and analysis of sentences other than those it now specifies. (Author)

AD-614 258 Div. 30, 32

National Bureau of Standards, Washington, D. C.
A PREREQUISITE TO THE UTILITY OF MICROGRAMMARS,
by William C. Watt. 19 Apr 65, 26p
Technical note no. TN-258

Unclassified report

Available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.25, as C13.46:258.

Descriptors: (*Programming (Computers), Language), Programming languages, Artificial intelligence, Computers, Analysis.

This paper takes up the question of a hitherto-ignored obstacle to the useful functioning of micrograrmars in artificial intelligence systems. This obstacle consists of the difficulty of 'staying within' the micrograrmar in man-machine communication, a condition rooted in the fact that micrograrmars produce a 'language' which consists entirely of English sentences, but of only some English sentences: and it is hard or even impossible for the micrograrmar-user to remember which sentences he is allowed to use. Besides raising this problem, and studying it in some detail, I indicate what steps may be taken to overcome it; these are such steps as lend the micrograrmar more 'extrapolative symmetry'. (Author)

AD-614 272 Div. 30, 6, 8, 25
CFSTI Prices: HC$2.00 MF$0.50

Electro-Dynamics Labs., Utah State Univ., Logan.
RESTORATION OF OPTICAL PATTERNS,
by C. K. Rushforth. 1 Mar 65, 30p
Scientific rept. no. SR-3
Contract AF19 628 3825, Proj. 8663, ARPA Order 450
AFCRL 65-181

Unclassified report

See also AD-610 712.

Descriptors: (*Optical images, Pattern recognition), (*Pattern recognition, Communication theory), (*Communication theory, Pattern recognition), Signal-to-noise ratio, Optics, Diffraction, Statistical analysis.

This paper treats the problem of estimating the intensity distribution of an optical pattern which has been distorted by diffraction and noise. Under the assumption that the signal and noise are additive and that they have prescribed means and covariance matrices, the optimum linear estimate of the object distribution is obtained. This estimate is shown to be a linearly-filtered combination of the a priori mean and the observed image distribution, with the details of the filtering depending on the prior information, the noise statistics, and the optical imaging system. The performance of the optimum estimation procedure is evaluated for the important special case of large a priori uncertainty. Finally, the optimum procedure for processing multiple observations is discussed. It is shown that as the number of observations becomes large, the estimate approaches the true object. (Author)

AD-614 281 Div. 30, 12, 15
CFSTI Prices: HC$3.00 MF$0.75

Naval Ordnance Test Station, China Lake, Calif.
THE ANALYSIS OF ROUND-OFF AND TRUNCATION ERRORS OF THE CONTROLLER IN A HYBRID (DIGITAL-ANALOG) CONTROL SYSTEM,
by E. E. Curry. Mar 65, 68p
Rept. no. NOTS-TP-3785
Task RMWC24 088 216 1F009 04 02
NAVWEPS 8729

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC.
Copy is available for public sale.

Descriptors: (*Analog-digital computers, Servomechanisms), (*Servomechanisms, Analog-digital computers), (*Guided missile launchers, Servomechanisms), Errors, Real time, Control systems, Analysis.

The round-off or truncation errors of a digital-analog servo system are studied in terms of the least upper bound and second moment or variance. The study was applied to the azimuth function of the Mk 13 Guided Missile Launcher System and a digital controller designed for the launcher. The techniques are such that they can be generalized and applied to other analog-digital or digital systems. This report is a facsimile of a thesis written in partial satisfaction of the requirements for a degree of Master of Science in Engineering. (Author)

AD-614 282 Div. 30, 17, 25
CFSTI Prices: HC$4.00 MF$1.00

Redstone Scientific Information Center, Redstone Arsenal, Ala.
PHOTOELASTICITY: PRINCIPLES, METHODS AND APPLICATIONS TO MATERIALS TESTING, METALLURGY AND MECHANICS, PARTS I, II, III,
by Pierre Laurent and A. Popoff. Mar 65, 148p
RSIC-388
TT 65-62043

Unclassified report

Trans. of Revue de Metallurgie (France) v35 n8 p363-78; n9 p407-24; n10 p448-74 1938.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC.
Copy is available for public sale.

Descriptors: (*Photoelasticity, Test methods), (*Test methods, Photoelasticity), Metallurgy, Plastics, Design, Dynamics, Stresses, Optics, Elasticity, Structures, Mathematical analysis, Models (Simulation).

The practical utility of photoelasticity was proved experimentally. The results obtained optically agree with the values found by other methods on metal pieces. Nevertheless, despite the service already rendered by photoelasticity, some persons are reluctant to use it, considering it a delicate, difficultly interpretable method, and, especially, an expensive method. The use of synthetic resins had considerably modified the method, while preserving its precision. With these resins the cost price of a model is insignificant.

AD-614 287 Div. 30
CFSTI Prices: HC$2.00 MF$0.50

Bolt, Beranek and Newman, Inc., Cambridge, Mass.
INVESTIGATION OF THE THEORY OF ALGORITHMS WITH EMPHASIS ON PROGRAM SIMPLIFICATION.
Final rept. for Dec 63-Feb 65,
by David C. Luckham. 15 Feb 65, 37p Rept. no. 1225
Contract AF19 628 3995, Proj. 4641, Task 464102
AFCRL 65-170

Unclassified report

Descriptors: (*Programming (Computers), Theory), (*Optimization, Programming (Computers)), Metamathematics, Programming languages.

This report develops further the theory of program schemes previously studied by Ianov and by Luckham, Park and Marill. The aim of the work is to provide general insights into computer programming problems, in particular regarding the question of optimization. New results are given and techniques for finding removable parts of program schemes and for shortening loops are discussed. (Author)

AD-614 322 Div. 30, 25

Army Electronics Labs., Fort Monmouth, N. J.
CURIE POINT MEASUREMENT AT HIGH PRESSURE BY A SINGLE COIL TECHNIQUE,
by G. A. Samara and A. A. Giardini. 6 Oct 64, 3p

Unclassified report

Pub. in The Review of Scientific Instruments v36 n1 p108-10 Jan 1965
(Copies not available to DDC or Clearinghouse customers.)

Descriptors: (*Transition temperature, Magnetism), (*Ferromagnetic materials, Transition temperature), Measurement, Test methods, High-pressure research, Coils, Pressure.

A simple method is described for studying the change of ferromagnetic Curie point with pressure. It can be used both in hydrostatic apparatus and in apparatus utilizing solid pressure transmitting media and has the distinct advantage in that only two electrical leads are required. Typical results on two materials are presented. The sensitivity and resolution are shown to be as good as previously used methods.

AD-614 393 Div. 30, 9
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
OBTAINING INTENSIVE MOLECULAR BEAM,
by Yu. N. Belyaev and V. B. Leonas. 30 Mar 65, 17p
FTD-TT-65-71
TT 65-62069

Unclassified report

Unedited rough draft trans. of Moscow Univ. Vestnik. Seriya 3: Fizika, Astronomiya (USSR) v18 n5 p34-42 1963.

Descriptors: (*Molecular beams, Laboratory equipment), Design, Fluid dynamics, Velocity, Surface properties, Supersonic nozzles, Gases, Vacuum apparatus, Solids, Scattering, Performance (Engineering), Intensity, USSR.

A gasdynamic source of a molecular beam is described. The intensity of the beam realized by such a source exceeds the intensity of a classical furnace source by a factor of 70. Using mixtures as the working gas permits even a greater increase in intensity as well as the velocity of molecules in the beam. (Author)

AD-614 397 Div. 30, 26
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
ULTRASONIC FLAW DETECTOR,
by V. I. Starokol'tsev, D. V. Kostyukov, and A. V. Malinka. 30 Mar 65, 5p FTD-TT-65-135
TT 65-62073
Unclassified report

Unedited rough draft trans. of Russian patent 155,317, appl. no. 781,246/25-8, Dec 1 1964.

Descriptors: (*Non-destructive testing, Ultrasonic radiation), (*Ultrasonic radiation, Non-destructive testing), (*Welds, Non-destructive testing), Test equipment, Errors, USSR, Quality control.

The object of the invention is a ultrasonic flaw detector (for example, for the control of welded seams) in which an ultrasonic beam is directed at an angle to the surface of the article being inspected. The flaw detector utilizes two emitters with obliquely placed piezoelements symmetrically oriented with respect to both sides of the seam being examined and a switching device for periodic, alternate switching of the piezoelements as emitter or receiver of ultrasonic oscillations such that each piezoelement receives both its own radiation reflected from the seam and also radiation from the second cap passing through the seam being tested.

AD-614 413 Div. 30, 15
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
A SHORT COURSE IN MODEL DESIGN,
by Ira S. Lowry. Apr 65, 27p Rept. no. P-3114
Unclassified report

Prepared for publication in the Journal of the American Institute of Planners, vol. 31, no. 2, May 1965.

Descriptors: (*Urban planning, Mathematical models), (*Mathematical models, Urban planning), Programming (Computers), Systems engineering, Monte carlo method, Management planning.

The interest in the use of computer models as an aid to urban planning and administration has grown rapidly. The report is designed to provide some orientation to the model-builder's way of thinking, to interpret the jargon of his trade, and to suggest a few standards for the evaluation of his product.

AD-614 417 Div. 30
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
SOME REFLECTIONS ON A SURVEY OF RESEARCH PROBLEMS IN COMPUTER SOFTWARE,
by F. M. Tonge. Apr 65, 28p Rept. no. RM-4467-PR
Contract AF49 638 700
Unclassified report

Descriptors: (*Programming languages, Scientific research), Programmers, Attitudes, Programming (Computers), Machine translation, Computers.

After a brief discussion of the role of software in computer usage, the Memorandum presents the views of some workers in the software field on appropriate directions and emphases for software research. The problems stated here concern the development of computer languages and representations, the efficiency of the programming and translation processes, and the environment in which programmers and programs interact. There is an extensive discussion of the key problem of making computers accessible to the non-professional user. (Author)

AD-614 424 Div. 30, 9
CFSTI Prices: HC$2.00 MF$0.50

Lincoln Lab., Mass. Inst. of Tech., Lexington.
CALIBRATION OF A PRESSURE SENSOR FOR MEASUREMENTS IN CONTINUUM AND RAREFIED GAS FLOWS,
by W. M. Kornegay and J. D. Fridman. 8 Feb 65, 29p Technical rept. no. TR-379
Contract AF19 628 500, ARPA Order 600
ESD TDR-65-43
Unclassified report

Descriptors: (*Pressure, Measurement), (*Shock waves, Gas flow), (*Piezoelectric transducers, Pressure), Calibration, Low-pressure research, Stagnation point, Shock tubes, Reynolds number.

The free-stream flow behind shock waves produced in the laboratory has been used to obtain a dynamic calibration of a highly sensitive piezoelectric pressure sensor under a wide variety of conditions. Experimental results on the influence of rarefied gas flow on the value of stagnation pressure measured with the sensor are described. This report covers the continuum, slip and transition flow regimes. Design characteristics of the pressure sensor are presented and experimental results are discussed in view of the impact pressure measurements of other authors. (Author)

AD-614 453 Div. 30, 2, 31
CFSTI Prices: HC$2.00 MF$0.50

Woods Hole Oceanographic Institution, Mass.
DEEP SUBMERGENCE RESEARCH.
Annual rept. for 1 Jan-31 Dec 64.
Feb 65, 36p Ref.-65-11
Contract Nonr348400, Proj. NR260 107
Unclassified report

See also AD-295 079.

Descriptors: (*Oceanographic vessels, Submarines), Instrumentation, Tests, Operation, Oceanography, Training.

During the report period the Deep Submergence Research Program at Woods Hole Oceanographic Institution moved steadily forward with the inspection of the final assembly and test of the 6,000 foot Deep Submergence Research Vehicle (DSRV) ALVIN. The vehicle was received in Woods Hole in May and was commissioned on June 5, 1964. Subsequently, a series of some 70 dives in shallow water were conducted for operator training and scientist orientation. A discussion of operations, use of instruments, construction of a catamaran for a support vessel, support equipment and miscellaneous testing programs is included. The submarine is presently undergoing an extensive inspection and refit period, the results of which are reported. Technical reports that include the details of some of the activity are referenced. (Author)

AD-614 489 Div. 30, 8

Northwestern Univ., Evanston, Ill. Technological Inst.
A STABILITY CRITERION FOR PULSE-WIDTH-

MODULATED FEEDBACK CONTROL SYSTEMS.
Revised ed.,
by G. J. Murphy and S. H. Wu. 5 Aug 64, 8p
Grant AF AFOSR270 63
AFOSR 65-0627

Unclassified report

Pub. in IEEE Transactions on Automatic Control vAC-9 n4 p434-41 Oct 1964 (Copies not available to DDC or Clearinghouse customers).
Revision of manuscript submitted 30 Mar 64.

Descriptors: (*Control systems, Stability), (*Pulse modulation, Control systems), (*Feedback, Control systems), Nonlinear systems, Sampling, Time, Mathematical analysis, Theory, Vector analysis.

Aizerman's method for investigating asymptotic stability in the large (Avtomatika i Telemekhanika, 7:no. 2-3 (1949)), which was extended by Kodama to encompass nonlinear sampled-data systems (IRE Trans. on Automatic Control, 7:102-109 (Oct 1962)), is further extended in this paper. The concept is developed with specific reference to pulse-width-modulated feedback systems, but the method is applicable to a more general class of nonlinear discrete-time system. The significant difference between the class of systems treated here and the class treated by Kodama is that in the latter class the nonlinear factor is a scalar, whereas in the former, it is a vector. This difference is not trivial; the presence of the vector nonlinearity requires a substantial change in the procedure for determining the range of a parameter over which the system is asymptotically stable in the large. By application of the method presented in this paper, one can obtain a sufficient condition for asymptotic stability in the large of pulse-width-modulated feedback systems. The method is not limited to cases in which the poles of the transfer function of the plant are real and/or simple and the result obtained, at least in those cases investigated to date, is not highly conservative. (Author)

31. Ships and Marine Equipment

AD-614 011 Div. 31, 30
CFSTI Prices: HC$3.00 MF$0.75

Woods Hole Oceanographic Institution, Mass.
THE MECHANICAL AND CHEMICAL PROPERTIES OF THE HY 100 PRESSURE HULLS OF THE SUBMARINE, ALVIN.
Technical rept.,
by James W. Mavor, Jr. Jan 65, 60p
Ref-65-1
Contract Nonr348400, Proj. NR260 107
Unclassified report

Descriptors: (*Submarine hulls, Oceanographic vessels), (*Steel, Submarine hulls), Chemical properties, Mechanical properties, Failure (Mechanics), Welding, Loading (Mechanics), Heat treatment, Pressure vessels, Fracture (Mechanics), Toughness, Experimental data.

This report presents mechanical and chemical test data from the three pressure hulls fabricated for the Deep Research Submarine, ALVIN. The data is discussed briefly, the low Charpy V-Notch values after stress relief noted, and recommendations made for further testing required for design and evaluation. The three hulls are compared with reference to failure criteria. (Author)

AD-614 028 Div. 31
CFSTI Prices: HC$2.00 MF$0.50

David Taylor Model Basin, Washington, D. C.
STRUCTURAL AND MACHINERY VIBRATIONS OF HYDROFOIL SHIPS,
by Donald C. Robinson. Dec 64, 47p
Rept. no. 1877
Unclassified report

Descriptors: (*Hydrofoil boats, Vibration), Ship structural components, Ship hulls, Machines, Shipborne, Model tests, Computers, Instrumentation, Elasticity.

A study was made of the structural and machinery characteristics of several hydrofoil ships in order to determine parameters which are of main importance for vibration analyses. A preliminary hull vibration calculation of a hydrofoil ship was performed. Instrumentation requirements for a full-scale vibration trial of a hydrafoil boat were proposed for an experimental evaluation of theory. The relative merits of model tests and computer studies to provide answers to problem areas are discussed. (Author)

AD-614 071 Div. 31
CFSTI Prices: HC$1.00 MF$0.50

Woods Hole Oceanographic Institution, Mass.
A SHIPBOARD CABLE-HAULING SYSTEM FOR LARGE ELECTRICAL CABLES,
by F. R. Hess and L. V. Slabaugh. Feb 65, 15p
Ref-65-4
Contract Nonr402900, Proj. NR260 101
Unclassified report

Descriptors: (*Hoists, Shipborne), (*Reels, Electric cables), (*Electric cables, Reels), Marine engineering, Pneumatic devices, Oceanographic equipment, Specifications, Performance (Engineering).

An air-powered hauling machine and reeling device for use at sea with large electrical cable systems such as hydrophone arrays is described. The system may be used to haul cables from 0.3 to 2.0 inch diameter. Hauling tensions up to 980 lbs. and speeds up to 430 ft/min. are provided. The principal advantage of the system is that it does not cause the cable to bend while under tension. Reeling is accomplished under only sufficient tension to cause the cable to conform to the reel. (Author)

AD-614 114 Div. 31
CFSTI Prices: HC$1.00 MF$0.50

David Taylor Model Basin, Washington, D. C.
FREE-RUNNING MODEL TECHNIQUES FOR THE EVALUATION OF SHIP-HANDLING QUALITIES,
by S. C. Gover. Jul 59, 18p Rept. no. 1358
Unclassified report

Descriptors: (*Ships, Maneuverability), Ship models, Model tests, Roll, Pitch (Motion), Stability, Handling, Control systems, Propellers (Marine), Marine rudders, Design, Submarines.

The concept of 'definitive maneuvers' was introduced as the basic framework for establishing a system for evaluating handling qualities. The particular maneuvers selected for this purpose are the spiral, overshoot, and turning circle. The report describes model test methods used from definitive maneuvers. (Author)

AD-614 126 Div. 31

Portsmouth Naval Shipyard, N. H.
PORTSMOUTH NAVAL SHIPYARD FACILITIES FOR NOISE MEASUREMENT AND REDUCTION.
Jul 64, 24p
Unclassified report

Available only for reference at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Submarine noise, Test facilities), (*Test equipment, Underwater sound), (*Underwater sound, Submarines), Measurement, Reduction, Underwater sound equipment, Instrumentation, Noise analyzers, Electronic equipment, Frequency analyzers, Shipyards, Calibration, Maintenance, Vibration, Portable.

The Portsmouth Acoustic Radiation Measurement Basin (PARMB) provides a facility for performing overside acoustical sound surveys on year-round basis and can operate 24 hours a day. Ample shore power is available for both fleet type and nuclear submarines. Extremely quiet ambient noise levels (55-60 DB re 0.0002 Dynes/sq Cm) exist in the water at the basin. Isolation of this facility from the rest of the Shipyard and normal ship traffic offers ideal conditions for submarine sound testing.

AD-614 261 Div. 31, 4, 16
CFSTI Prices: HC$2.00 MF$0.75

Naval Research Lab., Washington, D. C.
THE PRESENT STATUS OF CHEMICAL RESEARCH IN ATMOSPHERE PURIFICATION AND CONTROL ON NUCLEAR-POWERED SUBMARINES.
Annual progress rept. no. 4,
ed. by L. B. Lockhart, Jr., and V. R. Piatt. 23 Mar 65
74p Rept. no. NRL-6251
Proj. SF013 08 03, Tasks 4092, 4093 Unclassified report

Descriptors: (*Life support, Submarines), (*Submarines, Life support), (*Nuclear powered vessels, Life support), (*Controlled atmospheres, Submarines), Air, Purification, Samplers, Gas analysis, Impurities, Chromatographic analysis, Carbon dioxide, Paints, Hydrogen monoxide, Carbon compounds, Monoxides, Amines.

This annual progress report supplements PB-161 518, AD-260 235, AD-284 576, and AD-435 518 which provided a comprehensive review of the past and present research and development effort of the U. S. Naval Research Laboratory on the atmospheric habitability of submarines. Emphasis is at present being devoted almost exclusively to nuclear-powered submarines. Considerable progress has been made in the major efforts of developing: (a) improved methods of sampling and analysis of atmospheres, (b) additives to decrease the degradation of monoethanolamine (MEA) in the CO2 scrubber, and (c) a system for maximum utilization of the carbon in the main ventilation filter. Other topics covered in the present report include the use of algae for oxygen production and carbon dioxide absorption, a study of water-thinned, fire-retardant paints, and a differentiation scheme for look-alike carbon and catalysts. (Author)

AD-614 421 Div. 31, 14, 17
CFSTI Prices: HC$2.00 MF$0.50

David Taylor Model Basin, Washington, D. C.
MATERIALS SURVEY FOR THE RESCUE AND SEARCH VEHICLES OF THE DEEP-SUBMERGENCE SYSTEMS PROJECT,
by Abner R. Willner and Marcel L. Salive. Mar 65, 46p Rept. no. 1987
Proj. 5 0003

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Submarine hulls, Materials), (*Alloys, Submarine hulls), High-pressure research, Titanium alloys, Aluminum alloys, Steel, Glass, Plastics, Glass textiles, Pressure vessels, Reinforcing materials, Chemical analysis, Compressive properties, Fatigue (Mechanics), Toughness, Corrosion,

Factors influencing the selection of materials for the pressure hulls of vehicles for the Deep Submergence Systems Project are presented. Aluminum, steels, and titanium are discussed with respect to such properties as chemistry, strength, fatigue, toughness, and corrosion. The suitability of these materials from a fabrication standpoint is also explored. It is concluded that 721-titanium alloy appears to be the best candidate for the pressure hulls of deep-submergence vehicles where high-strength low-weight characteristics are required. (Author)

32. Miscellaneous Arts and Sciences

AD-613 975 Div. 32
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
ANNOTATED BIBLIOGRAPHY OF RAND PUBLICATIONS IN COMPUTATIONAL LINGUISTICS,
by David G. Hays. Apr 65, 35p
Rept. no. RM-3894-1-PR
Contract AF49 638 700

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Language, Bibliographies), (*Documentation, Bibliographies), Information retrieval, Character recognition, Reading machines, Computers, Cybernetics, Artifical intelligence, Machine translation, Programming languages, Punched cards, Indexing, Probability, Abstracting.

This Bibliography comprises a listing of 93 RAND publications through February 1964, of which 29 are new. Older entries have been revised with new facts about place of final publication and availability from RAND. The subjects covered are linguistic theory, linguistic research methods, computational methods for linguistics, the Russian and English languages, information retrieval, automatic content analysis, psycholinguistics, and character readers. The bibliography does not include information theory in the sense of probabilistic analysis of communication channels, artificial intelligence, or nerve-net simulation. Sources of availability (besides RAND) are given. (Author)

AD-614 005 Div. 32, 30
CFSTI Prices: HC$1.00 MF$0.50

Center for Documentation and Communication Research, Western Reserve Univ., Cleveland, Ohio.
METHODOLOGY FOR TEST AND EVALUATION OF INFORMATION RETRIEVAL SYSTEMS,
by William Goffman and Vaun A. Newill. Jul 64, 22p Rept. no. CSL-TR-2
Grants AFOSR403 63, PHS FR00118 01A1
AFOSR 65-0587

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Information retrieval, Test methods), Data processing systems, Computers, Systems engineering, Search theory, Programming (Computers), Check-out procedures, Correlation techniques.

Information retrieval systems are discussed in terms of their purpose and function. The essential components of an information retrieval system are defined. A methodology for evaluating the comparative performance of systems is developed. Specific measures and methods of analysis of results are presented. (Author)

AD-614 025 Div. 32, 18, 23, 30
CFSTI Prices: HC$1.00 MF$0.50

Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.
MARVELOUS ORBIT,
by D. Isakov. 26 Mar 65, 13p FTD-TT-64-1372
TT 65-61997

Unclassified report

Unedited rough draft trans. from Krasnaya Zvezda (USSR) p3 Aug 11 1964.
Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Scientific personnel, USSR), Military personnel, Chemistry, Education.

AD-614 066 Div. 32, 23, 26, 28
CFSTI Prices: HC$1.00 MF$0.50

Naval Ordnance Test Station, China Lake, Calif.
SELECTED BIBLIOGRAPHY OF PUBLICATIONS, PAPERS, AND REPORTS IN THE SOCIAL, BEHAVIORAL, AND ADMINISTRATIVE SCIENCES.
Dec 64, 25p NOTS AdPub-123

Unclassified report

Descriptors: (*Social sciences, Bibliographies), (*Bibliographies, Social sciences), (*Management engineering, Bibliographies), Human engineering, Personnel management, Management planning, Scientific personnel, Training, Psychology, Deterrence, Performance (Human), Programming (Computers), Reports, Reviews, Research program administration.

The bibliography covers publications written by NOTS employees in the social, behavioral, and administrative sciences. Categories included are Open Literature Publications, Administrative Publications, Theses, Papers presented at Meetings and Conferences, Technical Progress Reports, and Unpublished Reports. An author index is provided, and mailing addresses of selected authors are included. (Author)

AD-614 093 Div. 32
CFSTI Prices: HC$4.00 MF$1.00

Cambridge Language Research Unit (England).
SEMANTIC BASIS OF COMMUNICATION.
Final rept.,
by Yorick Wilks, David Shillan, John Dobson, and K. Sparck Jones. 31 Dec 64, 117p M L-171
Contract AF61 052 647, Proj. 9769, Task 976905
AFOSR 65-0513

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Language, Speech representation), (*Speech representation, Language), Social communication, Search theory, Set theory, Programming (Computers), Dictionaries.

A semantic recognition procedure is defined in which interlingually coded text is machine searched with an inventory of semantic targets. From the result of this search a final message structure for a text is constructed by means of a system of rules for 'semantic well-formedness'. A theory of intonational forms, and phonetic recognition procedures relevant to it, are described. What it would be to verify Guberina's hypothesis about the relation of phonetic and semantic structures in text is suggested. (Author)

AD-614 190 Div. 32

Air Force Office of Scientific Research, Washington, D. C.
CONVERSATION ON INDIAN LIBRARIES,

by Harold Wooster. 1964, 7p AFOSR 65-0490
Proj. 9769

Unclassified report

Pub. in IASLIC Bulletin v9 n3 p122-6 Sep 1964 (Copies available only to DDC users).

Descriptors: (*Libraries, India), Documentation, Catalogs, Classification, Humidity.

This article comments on a number of surface differences between U. S. and Indian library practices as noted on a short trip to India. Topics covered include social status of librarians, use of typewriters, humidity control, leather bindings, U. S. use of Library of Congress and Dewey classification and cards as contrated with Indian use of U.D.C., and the cataloging problems thereby created, and dictionary vs. classified catalogs. (Author)

AD-614 252 Div. 32, 15
CFSTI Prices: HC$3.00 MF$0.75

Institute for Mathematical Studies in the Social Sciences, Stanford Univ., Calif.
THEORY OF GROWTH: REMODELLING AND REFINEMENTS,
by Michio Morishima. 12 Apr 65, 62p
Technical rept. no. TR-132
Contract Nonr22550, Proj. NR047 004

Unclassified report

See also AD-609 306, AD-609 307.

Descriptors: (*Economics, Mathematical models), Theory, Consumption, Industrial production, Optimization, Labor, Population, Distribution (Economics).

When all the factors of production are produced in the system and capitalists' consumption is allowed, the existence of the Golden Equilibrium (or the von Neumann equilibrium) can be proved even with a weak Malthusian assumption. The equilibrium turns out to be a state of instantaneous efficiency as well as a temporary Pareto optimum. However, its intertemporal efficiency and optimality do not necessarily follow. If all goods and labor are provided at the beginning in positive amounts without the limitational factor being specified, then all efficient paths defined in terms of the final stages converge on the turnpike in the broad sense that the average output per man over T periods of each goods approximates the turnpike output per man when T tends to infinity. In addition, the consumption turnpike theorem is discussed on the assumption that society maximizes the utility that depends on the discounted average of consumption streams and the population stream. (Author)

AD-614 356 Div. 32

Office of Naval Research, Washington, D. C.
GOVERNMENT SOURCES OF R AND D INFORMATION,
by Charles De Vore. 1965, 4p

Unclassified report

Pub. in Signal p9-11 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Documentation, Libraries), (*Scientific research, Sources), Reports, Distribution, Department of Defense, United States Government.

A listing is given of 22 information centers compiled by the Department of Defense. Information announcement bulletins issued by AEC, NASA, and the Department of Commerce are mentioned, along with the dissemination capability of the Government Printing Office.

AD-614 406 Div. 32, 20
CFSTI Prices: HC$1.00 MF$0.50

Radiation Effects Information Center.
RADIATION EFFECTS INFORMATION CENTER, MONTHLY ACCESSION LIST. COORDINATE INDEX, PART II, FOR ACCESSION LISTS FROM OCTOBER 1, 1964 TO MARCH 31, 1965.
10 Apr 65, 18p

Unclassified report

Descriptors: (*Radiation damage, Indexes), (*Indexes, Radiation damage), Documentation, Materials, Scientific organizations.

The index is subdivided into four sections. The first, Radiation Environment, includes dosimetry and energy aspects of all electromagnetic and particulate radiation sources, with the exception of space radiation. Section two deals with materials, properties, secondary environment (including space environments), devices, and all other subject concepts. An author section and a generating organization section is added to this quarterly index, as sections three and four. Under each concept term in the index are listed the accession numbers of the abstracts which have been indexed by that term. Links have been added where necessary to obviate improper coordination with the resulting false retrieval. Experience demonstrated that only four of the proposed EJC standard role indicators would have been required with any significant number of the entries.

AD-614 407 Div. 32
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
A NEW LOOK AT CUSTOMS UNION THEORY,
by C. A. Cooper and B. F. Massell. Apr 65, 10p
Rept. no. P-2972-2

Unclassified report

Descriptors: (*Economics, Commerce), (*Commerce, Theory), Industrial production, Consumption.

The theory of customs unions is reviewed, especially the events following the pioneering work of Viner (Jacob Viner, 'The Customs Union Issue,' New York, Carnegie Endowment for International Peace, 1950) and that of Lipsey (R. G. Lipsey, 'Trade Diversion and Welfare,' Economica, 24:40-46 (1957) and 'The Theory of Customs Unions: A General Survey,' Economic Journal, 70:496-513 (1960)). Arguments are given concerning 5 facets of customs unions (AD-608 628).

AD-614 438 Div. 32
CFSTI Prices: HC$1.00 MF$0.50

Virginia Univ., Charlottesville. Library.
SCIENCE-TECHNOLOGY SUBJECT-HEADING LISTS IN ENGLISH, RECENT OR STILL USEFUL IN PROGRAMMING INFORMATION RETRIEVAL SYSTEMS.
Edition no. 2,
by John Cook Wyllie. April 65, 9p

Unclassified report

Descriptors: (*Subject indexing, Information retrieval), (*Information retrieval, Subject indexing), (*Indexes, Documentation), Classification, Dictionaries, Libraries, Scientific research, Reports.

33. Transportation

AD-614 431 Div. 33, 11, 13
CFSTI Prices: HC$3.00 MF$0.75

Army Cold Regions Research and Engineering Lab., Hanover, N. H.
SURVEY OF SNOW AND ICE REMOVAL TECHNIQUES, by L. D. Minsk. Dec 64, 55p Technical rept. no. TR-128
Unclassified report

Descriptors: (*Snow removal, Reviews), (*De-icing materials, Reviews), (*Ice, Disposal), Runways, Roads, Vehicles, Thermal radiation, Chemicals, Europe, Canada, United States.

This report summarizes snow removal techniques, status of knowledge in this field as of 1960, and future considerations. During the winter of 1958-59, a comprehensive survey of snow and ice removal practices at eight Air Force bases, thirteen state highway departments, and one R.C.A.F. base in Canada was made. During Jan-March 1960, a similar survey was made in six European countries. Mechanical, chemical, and thermal methods of snow removal are discussed and extensive data are given on various types of snow and ice removal equipment. (Author)

*SHEFFIELD UNIV (ENGLAND)
* * *
HIC 45
INTENTIONAL COMBUSTION OSCILLATIONS IN PROPULSION SYSTEMS.
(AFOSR 64 2029)
AD-608 206 DIV. 25

The three asterisks serve as a separator between entries for reports under the same corporate author.

When a report lists a monitoring agency, a corresponding entry is provided under the name of the monitoring agency, which appears in alphabetical order among the corporate author entries. In a monitoring agency entry, the report number is given above the title in place of the originator's report number. A typical monitoring agency entry is shown below.

*AIR FORCE OFFICE OF SCIENTIFIC RESEARCH WASHINGTON D C
* * *
64 2029
INTENTIONAL COMBUSTION OSCILLATIONS IN PROPULSION SYSTEMS.
AD-608 206 DIV. 25

CONTRACT INDEX

The Contract index is arranged alphanumerically by contract number. Within a contract grouping, each entry contains corporate author, series number (if any), monitor number (if any), AD number, and division number.

When there are multiple document entries under one contract number, entries are arranged by AD number under each corporate author represented.

A contract entry may also contain a letter F, A, or S on the left-hand margin, indicating that the document is a Final, Annual, or Summary report. A typical contract entry is shown below.

*AF19 628 500
LINCOLN LAB MASS INST OF TECH LEXINGTON
LL TR 365
(ESD TDR64 378)
AD-608 272 DIV. 30
LL 1964 63
(ESD TDR64 566)
AD-608 288 DIV. 8

AD-DIVISION INDEX

The AD-Division Index is arranged numerically by AD number and lists the subject division where the full entry can be located in TAB.

How To Use Indexes To TAB Portion Of

U. S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS

SUBJECT INDEX

The Subject Index is arranged alphabetically by asterisked descriptors from the document announcements in the TAB. Each announcement contains one or more asterisked descriptors which identify the main subjects of the report. The asterisked descriptor may or may not have a modifying descriptor appearing directly below the asterisked descriptor. Under each descriptor entry in the Subject Index appear the following items of information: annotation, AD number, and division number. A typical subject index entry is shown below.

*COMBUSTION
OSCILLATION
INTENTIONAL COMBUSTION
OSCILLATIONS IN PROPULSION
SYSTEMS
AD-608 206 DIV. 25

PERSONAL AUTHOR INDEX

The Personal Author Index is arranged alphabetically by the last names of the authors of reports. When several report entries are given for one author, the entries are arranged numerically by AD number. Division numbers and titles are also listed. Again, three asterisks serve as a separator between entries for reports under the same author. A typical personal author entry is shown below.

*BENDAT, JULIUS S.
* * *
ZERO CROSSINGS OF A SINE
WAVE PLUS RANDOM NOISE
AD-608 019 DIV. 15
* * *
SPECTRA AND AUTOCORRELATION
FUNCTIONS FOR FULLY DEVELOPED
SEAS AND PREDICTION OF STRUCTURAL
FATIGUE DAMAGE
AD-608 464 DIV. 2

CORPORATE AUTHOR-MONITORING AGENCY INDEX

The Corporate Author-Monitoring Agency Index is arranged alphabetically by corporate authors and monitoring agencies.

In the corporate author entry (designated by an asterisk) for each document are listed the originator of the report, the originator's report number, the title, AD number, and division number. If the source has listed a monitoring agency in the report, the monitor acronym and monitor series number are given in parantheses directly under the title. An IDEP (Interservice Data Exchange Program) report number is presented in the same way. A typical corporate author entry is shown on the next page.

SUBJECT INDEX

•ABSORPTION SPECTRUM
LASERS
REPRINT: A QUANTUM MECHANICAL EVALUATION OF LINE BREADTHS INVOLVED IN TUNED-LASER ABSORPTION AND STIMULATED EMISSION SPECTROSCOPY.
AD-614 383 DIV. 25

NITROGEN COMPOUNDS
REPRINT: CHARGE-TRANSFER ABSORPTION SPECTRA OF NO IN KR AND CH3OH SOLUTIONS.
AD-614 552 DIV. 25

STRAIN (MECHANICS)
REPRINT: THE EFFECT OF STRAIN ON THE EXCITON SPECTRUM OF GERMANIUM.
AD-614 200 DIV. 25

•ACCELEROMETERS
ERRORS
TRANSDUCERS FOR SONIC FATIGUE MEASUREMENTS.
AD-613 946 DIV. 30

•ACCLIMATIZATION
SYMPOSIA
REPRINT: PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON COLD ACCLIMATION HELD AT INSTITUTO ANTARTICO ARGENTINO, BUENOS AIRES, AUGUST 5-7, 1959.
AD-614 146 DIV. 16

•ACETATES
HYDROLYSIS
REPRINT: EFFECT OF PRESSURE ON THE HYDROLYSIS OF METHYL ACETATE AND ETHYLENE OXIDE IN ACETONE WATER MIXTURES: QUANTITIES OF ACTIVATION AT CONSTANT VOLUME, AND THE ISOKINETIC PRESSURE.
AD-614 516 DIV. 4

PYROLYSIS
REPRINT: PYROLYSIS STUDIES. STERIC INHIBITION OF RESONANCE IN THE VAPOR PHASE.
AD-613 921 DIV. 4

•ACOUSTIC PROPERTIES
METALS
REPRINT: DETERMINATION OF ELECTRON RELAXATION TIME FROM THE GIANT QUANTUM OSCILLATIONS IN THE ACOUSTIC ABSORPTION OF METALS.
AD-614 527 DIV. 25

•ACOUSTICS
AMPLIFIERS
MICROWAVE RESEARCH: ACOUSTICS, LASERS, OPTICS, SEMICONDUCTORS, AND SOLID STATE PLASMA STUDIES.
AD-614 099 DIV. 25

SOLAR ATMOSPHERE
REPRINT: PROPAGATION OF ACOUSTIC WAVES THROUGH THE SOLAR CHROMOSPHERE.
AD-613 914 DIV. 25

UNDERWATER
REPRINT: ANALYSIS OF SPREADING LOSS FOR REFRACTED/REFLECTED RAYS IN CONSTANT-VELOCITY-GRADIENT MEDIA.
AD-614 196 DIV. 25

•ADENOVIRUSES
EPIDEMIOLOGY
REPRINT: PATTERNS OF ADENOVIRUS INFECTIONS IN MARINE CORPS PERSONNEL. I. A 42-MONTH SURVEY IN RECRUIT AND NONRECRUIT POPULATIONS. II. LONGITUDINAL STUDY OF SUCCESSIVE ADVANCED RECRUIT TRAINING COMPANIES.
AD-614 306 DIV. 16

•ADHESION
VINYL PLASTICS
REPRINT: PROBLEMS OF ADHESION WITH CATHODIC PROTECTION.
AD-614 551 DIV. 4

•ADSORPTION
STRONTIUM
REPRINT: THERMAL DESORPTION OF SR FROM W.
AD-614 142 DIV. 25

•AERODYNAMIC CHARACTERISTICS
HANDBOOKS
HANDBOOK OF SUPERSONIC AERODYNAMICS: PROPERTIES OF GASES.
AD-613 972 DIV. 9

•AGGLUTININS
COUNTING METHODS
REPRINT: EVALUATION OF ELECTRONIC MEASUREMENTS OF HEMAGGLUTINATION FOR QUANTITATIVE STUDIES. I. LIMITATIONS IN THE APPLICATION OF INSTRUMENT MEASUREMENTS.
AD-614 344 DIV. 16

•AGING (MATERIALS)
SNOW
AGE HARDENING OF SNOW AT THE SOUTH POLE.
AD-614 430 DIV. 13

•AIR FORCE RESEARCH
BIBLIOGRAPHIES
OAR CUMULATIVE INDEX OF RESEARCH RESULTS, 1964.
AD-614 096 DIV. 30

COSTS
COST OF BASIC RESEARCH EFFORT: AIR FORCE EXPERIENCE, 1954-1964.
AD-614 030 DIV. 30

•AIR MASS ANALYSIS
PROGRAMMING (COMPUTERS)
TRANSLATION OF RUSSIAN RESEARCH: FORMULATION OF TRAJECTORIES OF AIR PARTICLES WITH THE AID OF ELECTRONIC COMPUTERS.
AD-614 021 DIV. 2

•AIR TRAFFIC CONTROL SYSTEMS
VERY HIGH FREQUENCY
COMPARISON OF TWO VHF COMMUNICATION FREQUENCY ASSIGNMENT METHODS.
AD-614 443 DIV. 19

•AIRCRAFT
CELESTIAL NAVIGATION
NAVIGATIONAL CAPABILITY FOR PRUGRAM 665A WITH AN/ASN24V(MOD) DIGITAL COMPUTER.
AD-613 941 DIV. 19

LOW ALTITUDE
ENVIRONMENTAL CONDITIONS TO BE CONSIDERED IN THE STRUCTURAL DESIGN OF AIRCRAFT REQUIRED TO OPERATE AT LOW LEVELS.
AD-614 460 DIV. 1

STABILITY
TRANSLATION OF RUSSIAN RESEARCH: EXPERIMENTAL PROGNOSES OF AIRCRAFT BUMPINESS BY A DEFINED RICHARDSON CRITERION.
AD-614 016 DIV. 1

•AIRCRAFT SEATS
AVIATION SAFETY
DEVELOPMENT OF A CRASHWORTHY, ARMORED, UNIVERSAL CREW SEAT FOR U. S. ARMY AIRCRAFT.
AD-614 231 DIV. 1

•AIRFOILS
INTEGRALS
REPRINT: CALCULATION OF AN INTEGRAL IN THE ANALYSIS OF RING AIRFOILS.
AD-614 139 DIV. 9

SHOCK WAVES
REPRINT: INTERACTION OF A STARTING VORTEX AS WELL AS A VORTEX STREET WITH A TRAVELING SHOCK WAVE.
AD-614 311 DIV. 9

•ALCOHOLS
FUEL CELLS
TRANSLATION OF EAST GERMAN ARTICLE DEVELOPMENT OF FUEL CELL ELECTRICAL ENERGY SOURCES.
AD-614 388 DIV. 7

•ALDEHYDES
SYNTHESIS (CHEMISTRY)
PHOTOCHEMICAL SYNTHESIS OF ANTI-ISONICOTINALDEHYDE OXIME.
AD-614 245 DIV. 16

•ALGEBRAIC TOPOLOGY
COMBINATORIAL ANALYSIS
REPRINT: PRODUCTS BETWEEN HOMOTOPY GROUPS AND THE J-MORPHISM.
AD-614 157 DIV. 15

POTENTIAL THEORY
REPRINT: HARMONIC FUNCTIONS WITH GIVEN VALUES AND MINIMUM NORMS IN RIEMANNIAN SPACES.
AD-614 543 DIV. 15

•ALGEBRAS
GROUPS (MATHEMATICS)
DERIVATIONS OF OPERATOR GROUP ALGEBRAS.
AD-613 927 DIV. 15

OPERATORS
DERIVATIONS OF OPERATOR ALBEGRAS.
AD-613 928 DIV. 15

OPERATORS (MATHEMATICS)
NOTE ON DERIVATIONS OF OPERATOR ALGEBRAS.
AD-613 926 DIV. 15

•ALIPHATIC COMPOUNDS
THERMODYNAMICS
REPRINT: EXCESS THERMODYNAMIC FUNCTIONS FOR LIQUID MIXTURES OF METHANEPROPANE.
AD-614 517 DIV. 4

•ALKALI METALS
SPECIFIC HEAT
REPRINT: DEVIATIONS OF THE SPECIFIC HEATS OF THE ALKALI METALS FROM HARMONIC BEHAVIOUR. A POSSIBLE DEPENDENCE ON ISOTOPIC COMPOSITION OF THE ANHARMONIC CONTRIBUTION TO SPECIFIC HEAT.
AD-614 503 DIV. 25

•ALKALINE CELLS
PERFORMANCE (ENGINEERING)
EFFECT OF CARBONATED ELECTROLYTE ON THE PERFORMANCE OF SINTERED PLATE NICKEL-CADMIUM CELLS.
AD-614 104 DIV. 7

•ALKENES

FRIEDEL-CRAFTS REACTIONS
REPRINT: CO-CATELYSES IN FRIEDEL-CRAFTS REACTIONS. PART VII. THE FORMATION OF ULTRAVIOLET CHROMOPHORES.
AD-614 909 DIV. 4

•ALLOYS
ATOMIC STRUCTURE
TRANSLATION OF RUSSIAN RESEARCH: X-RAY EXAMINATION OF THE ORDERING PROCESS IN ALLOYS.
AD-614 387 DIV. 17

CRYSTALLIZATION
REPRINT: THERMAL CONVECTION DURING HORIZONTAL SOLIDIFICATION OF PURE METALS AND ALLOYS.
AD-614 182 DIV. 17

SUBMARINE HULLS
MATERIALS SURVEY FOR THE RESCUE AND SEARCH VEHICLES OF THE DEEP-SUBMERGENCE SYSTEMS PROJECT.
AD-614 421 DIV. 31

•ALPHA PARTICLES
SOLAR FLARES
REPRINT: SOLAR FLARE HIGH ENERGY ALPHA PARTICLES AND THEIR STORAGE IN INTERPLANETARY SPACE.
AD-614 217 DIV. 2

•ALUMINUM
COMBUSTION
ESTIMATING METAL PARTICLE COMBUSTION KINETICS; ALUMINUM, BERYLLIUM, MAGNESIUM.
AD-614 563 DIV. 10

NUCLEAR MAGNETIC RESONANCE
REPRINT: ESR MEASUREMENT OF SPIN SUSCEPTIBILITY OF GRAPHITE IN A LOW MAGNETIC FIELD.
AD-614 366 DIV. 20

•ALUMINUM ALLOYS
ATOMIC ENERGY LEVELS
ELECTRONIC STRUCTURE OF DILUTE SOLID SOLUTION ALLOYS OF 3DTRANSITION METALS IN A NON-MAGNETIC MATRIX.
AD-614 482 DIV. 25

CORROSION
STRESS-CORROSION CRACKING OF ALUMINUM ALLOYS.
AD-613 957 DIV. 17

STABILITY
DIMENSIONAL STABILITY OF SELECTED ALLOY SYSTEMS.
AD-613 931 DIV. 17

•ALUMINUM COMPOUNDS
OXIDES
MACHINING HIGH PURITY ALUMINA.
AD-614 467 DIV. 26

•AMINES
PHOSPHOPROTEINS
REPRINT: N-ACETYL GROUPS IN VITELLENIN.
AD-614 514 DIV. 16

•AMINO ACIDS
ABSORPTION (BIOLOGICAL)
REPRINT: SPECIFICITY OF AMINO ACID ENTRY ROUTES IN PIGEON ERYTHROCYTES.
AD-614 314 DIV. 16

•AMMONIA
NUCLEAR MAGNETIC RESONANCE
REPRINT: PREPARATION AND PROTON MAGNETIC RESONANCE STUDIES OF ANHYDROUS AMMONIA.
AD-614 377 DIV. 25

•AMMONIUM COMPOUNDS
FLUORINATION
ELECTROCHEMICAL STUDIES IN THE SYNTHESIS OF N-F COMPOUNDS: ELECTRODE AND HE HANDLING EQUIPMENT DEVELOP MENT.
AD-614 098 DIV. 4

PERCHLORATES
METHOD OF MEASURING THERMAL DIFFUSIVITY OF POORLY CONDUCTIVE MATERIALS WITH SPECIAL REFERENCE TO AMMONIUM PERCHLORATE.
AD-614 081 DIV. 25

•AMPHIBIANS
RETINA
INFORMATION PROCESSING IN THE FROG'S RETINA.
AD-614 249 DIV. 16

•AMPLIFIERS
CIRCUITS
REPRINT: OPERATIONAL AMPLIFIER CIRCUITS FOR CONTROLLED POTENTIAL CYCLIC VOLTAMMETRY, II.
AD-614 195 DIV. 4

LASERS
REPRINT: CRITERIA FOR OPTICAL MASER AMPLIFIERS AND OSCILLATORS.
AD-614 209 DIV. 25

•ANALOG COMPUTERS
CRYSTAL STRUCTURE
ANALOG COMPUTERS FOR X-RAY CRYSTAL ANALYSIS.
AD-613 925 DIV. 20

•ANALOG-DIGITAL COMPUTERS
SERVOMECHANISMS
THE ANALYSIS OF ROUND-OFF AND TRUNCATION ERRORS OF THE CONTROLLER IN A HYBRID (DIGITAL-ANALOG) CONTROL SYSTEM.
AD-614 281 DIV. 20

•ANTENNA COMPONENTS
PERFORMANCE (ENGINEERING)
INVESTIGATION OF A MULTIPLE BEAM SCANNING CIRCULAR ARRAY.
AD-614 288 DIV. 8

•ANTENNA RADIATION PATTERNS
PLASMA MEDIUM
ANTENNA RADIATION IN A MOVING DISPERSIVE MEDIUM.
AD-614 275 DIV. 8

SPIRAL ANTENNAS
DIPOLE EXCITED UNIDIRECTI ONALLY CONDUCTING SPHERE.
AD-614 078 DIV. 8

•ANTENNAS
DESIGN
ANTENNA WIRE SAG AND TENSION CALCULATIONS.
AD-614 079 DIV. 8

PLASMA SHEATH
AERODYNAMIC METHODS OF PRODUCING ANTENNA WINDOWS IN A PLASMA SHEATH.
AD-614 084 DIV. 8

SOUNDING ROCKETS
REPRINT: NRC DESIGNS ANTENNA FOR S-BAND BEACON IN SOUNDING ROCKETS. RESONANT SHUNT-FED RADIATOR USES AIR DIELECTRIC TO WITHSTAND HEAT.
AD-614 525 DIV. 8

SPACE COMMUNICATION SYSTEMS
STUDY OF SPECIAL BEAMSHAPING ANTENNAS. INVESTIGATION OF DIELECTRIC ELEMENTS FOR LIGHTWEIGHT, TRANSPORTABLE SATELLITE COMMUNICATIONS ANTENNAS.
AD-613 932 DIV. 8

•ANTIGENS AND ANTIBODIES
GUINEA PIGS
REPRINT: SPECIFICITY OF GUINEA-PIG ANTIBODIES AND DELAYED HYPERSENSITIVITY.
AD-614 179 DIV. 16

MOLECULAR STRUCTURE
REPRINT: COMPARISON OF THE PEPTIDE MAPS OF ANTIBODIES AGAINST AN ACIDIC AND A BASIC DETERMINANT GROUP.
AD-614 218 DIV. 16

PEPTIDES
REPRINT: PEPTIDE MAPS OF ANTIBODIES AGAINST AN ANTIGEN CONTAINING TWO DIFFERENT DETER MINANT GROUPS.
AD-614 313 DIV. 16

•ANTIMONY
ELECTRON TRANSITIONS
REPRINT: OBSERVATION OF INTERBAND TRANSITIONS IN ANTIMONY.
AD-614 312 DIV. 25

OXIDATION
OXIDATION OF ARSENIC (III) AND ANTIMONY (III).
AD-614 476 DIV. 4

•ARBOVIRUSES
ANTIGENS AND ANTIBODIES
REPRINT: THE NATURE OF ANTIBODIES FOLLOWING EXPERI MENTAL ARBOVIRUS INFECTION IN GUINEA PIGS.
AD-614 348 DIV. 16

•ARCTIC REGIONS
PLANTS (BOTANY)
ROLE OF PHYSIOLOGY AND ENVIRONMENT IN THE DISTRIBUTION OF ARCTIC PLANTS.
AD-614 079 DIV. 2

•ARGON
SCATTERING
REPRINT: CHARGE-STATE CORRELATIONS IN AR() - AR COLLISIONS.
AD-614 545 DIV. 25

•ARMED FORCES PERSONNEL
SELECTION
RESTANDARDIZATION OF THE ARMED FORCES WOMEN'S SELECTION TEST, AFWST 5 AND 6.
AD-614 400 DIV. 23

•ARMED FORCES PROCUREMENT
LAW
REPORT OF THE ATTORNEY GENERAL, PURSUANT TO SECTION 10(C) OF THE SMALL BUSINESS ACT OF 1958 AS AMENDED.
AD-614 474 DIV. 18

•ARMING DEVICES
GUIDED MISSILES (SURFACE-TO-SURFACE)
MECHANICAL DEVICE FOR SENSING ZERO G OR WEIGHTLESSNESS.
AD-613 937 DIV. 22

•ARMY AIRCRAFT
AIRCRAFT SEATS
DEVELOPMENT OF A CRASHWORTHY, ARMORED, UNIVERSAL CREW SEAT FOR U. S. ARMY AIRCRAFT.
AD-614 231 DIV. 1

•AROMATIC COMPOUNDS
NITRAMINES

REPRINT: REARRANGEMENT OF AROMATIC N-NITROAMINES. ACID-CATALYSED REARRANGEMENT OF N-NITROANILINE.
AD-619 219 DIV. 4

SYNTHESIS (CHEMISTRY)
REPRINT: NONBENZENOID AROMATIC SYSTEMS: SYNTHESIS OF 1-VINYLAZULENE AND SUBSTITUTED 1-VINYLAZULENES.
AD-619 491 DIV. 4

•ARSENIC
OXIDATION
OXIDATION OF ARSENIC (III) AND ANTIMONY (III).
AD-619 476 DIV. 4

PHYSICAL PROPERTIES
REPRINT: PHYSICAL PROPERTIES OF ALPHA AND GAMMA ARSENIC.
AD-619 506 DIV. 17

•ARTERIES
ELECTROLYTES (PHYSIOLOGY)
REPRINT: WATER AND ELECTROLYTE CONTENT OF NORMAL AND HYPERTENSIVE ARTERIES IN DOGS.
AD-619 561 DIV. 16

•ARTIFICIAL INTELLIGENCE
DECISION MAKING
EVALUATION OF TECHNIQUES AND DEVICES AS APPLIED TO PROBLEM SOLVING.
AD-619 228 DIV. 30

THEORY
THEORY OF THE COGNITRON, AN ARTIFICIAL INTELLIGENCE.
AD-619 006 DIV. 30

•ASTRONAUTS
RADIATION HAZARDS
INFLUENCE OF SHIELD GEOMETRY ON AIR DOSE AND TISSUE DOSE FROM PROTONS WITHIN A SPACE VEHICLE.
AD-613 993 DIV. 20

•ASTRONOMICAL GEODESICS
SATELLITES (ARTIFICIAL)
PROJECT ANNA (GEODETIC SATELLITE) OPTICAL OBSERVATIONS.
AD-613 938 DIV. 2

•ASTRONOMY
INTERFEROMETERS
REPRINT: THE STELLAR INTERFEROMETER AT NARRABRI.
AD-619 536 DIV. 2

LUNAR ENVIRONMENT
STUDIES OF THE PHYSICAL CHARACTERISTICS OF PROBABLE LUNAR SURFACE MATERIALS: PART II.
AD-613 969 DIV. 2

MOON
REPRINT: WAVELENGTH DEPENDENCE OF POLARIZATION. III. THE LUNAR SURFACE.
AD-619 170 DIV. 2

SOLAR ECLIPSES
TRANSLATION OF RUSSIAN RESEARCH: OBSERVATIONAL DATA FROM THE ANNULAR SOLAR ECLIPSE OF 31 JULY 1962.
AD-613 978 DIV. 2

•ASTROPHYSICS
EQUATIONS
REPRINT: ON THE OSCILLATIONS OF THE MACLAURIN SPHEROID BELONGING TO THE THIRD HARMONICS.
AD-619 158 DIV. 2

SOLAR ATMOSPHERE
REPRINT: PROPAGATION OF ACOUSTIC WAVES THROUGH THE SOLAR CHROMOSPHERE.
AD-613 914 DIV. 2
TRANSLATION OF RUSSIAN RESEARCH: USE OF RADIO DATA TO DETERMINE THE POSITION OF THE REGION IN WHICH THE CHARACTERISTICS OF THE SOLAR ATMOSPHERE CHANGE RAPIDLY.
AD-613 981 DIV. 2

SOLAR FLARES
REPRINT: SOLAR FLARE HIGH ENERGY ALPHA PARTICLES AND THEIR STORAGE IN INTERPLANETARY SPACE.
AD-619 217 DIV. 2

STARS
REPRINT: INFRARED PHOTOMETRY OF M-DWARF STARS.
AD-619 354 DIV. 2

•ATMOSPHERE MODELS
SOLAR RADIATION
MODEL ATMOSPHERES DETERMINED BY ABSORPTION OF SOLAR RADIATION.
AD-619 085 DIV. 2

SPECTRA (VISIBLE AND ULTRAVIOLET)
COMPARISON BETWEEN MODEL ATMOSPHERES AND SPECTRA FROM EARLY-TYPE STARS.
AD-619 523 DIV. 2

•ATMOSPHERIC MOTION
AERONAUTICS
TRANSLATION OF RUSSIAN RESEARCH: EXPERIMENTAL PROGNOSES OF AIRCRAFT BUMPINESS BY A DEFINED RICHARDSON CRITERION.
AD-619 016 DIV. 1

•ATMOSPHERIC REFRACTION
EXTRATERRESTRIAL RADIO WAVES
REPRINT: IONOSPHERIC AND TROPOSPHERIC SCINTILLATIONS OF A RADIO STAR AT ZERO TO FIVE DEGREES OF ELEVATION.
AD-619 161 DIV. 2

LIGHT
OPTICAL SCINTILLATION IN ATMOSPHERE.
AD-619 056 DIV. 2

RADAR SIGNALS
A STATISTICAL ANALYSIS OF PHASE ERRORS AND PHASE DIFFERENCE ERRORS DUE TO THE ATMOSPHERE IN THE OBSERVATIONS OF THE RADAR RETURN FROM A SATELLITE.
AD-619 414 DIV. 6

•ATMOSPHERIC SOUNDING
ELECTRON DENSITY
REPRINT: CAUSE OF THE MID-LATITUDE EVENING ELECTRON DENSITY IN THE F SUB 0 F SUB 2 LAYERS OF THE IONOSPHERE.
AD-619 310 DIV. 2

INSTRUMENTATION
PROCEEDINGS OF THE SYMPOSIUM ON REMOTE SENSING OF ENVIRONMENT (3RD), 14-16 OCTOBER 1964.
AD-619 032 DIV. 30

IONOSPHERE
TRANSLATION OF RUSSIAN RESEARCH: IRREGULARITY STRUCTURE AND MOVEMENT IN THE IONOSPHERE.
AD-613 982 DIV. 2

USSR
TRANSLATION OF RUSSIAN RESEARCH: CLIMATE OF THE FREE ATMOSPHERE.
AD-613 988 DIV. 2

•ATMOSPHERICS
TERRESTRIAL MAGNETISM
RESULTS OF SIMULTANEOUS ELF MEASUREMENTS AT BRANNENBURG, GERMANY AND KINGSTON, R. I.
AD-619 012 DIV. 2

•ATOMIC CHARGE
ARGON
REPRINT: CHARGE-STATE CORRELATIONS IN AR(+) - AR COLLISIONS.
AD-619 545 DIV. 25

•ATOMIC ENERGY LEVELS
ALLOYS
ELECTRONIC STRUCTURE OF DILUTE SOLID SOLUTION ALLOYS OF 3DTRANSITION METALS IN A NON-MAGNETIC MATRIX.
AD-619 482 DIV. 25

•ATOMIC ORBITALS
INTEGRALS
REPRINT: CALCULATION OF SPIN-SPIN INTERACTION INTEGRALS.
AD-619 379 DIV. 25

•ATOMIC SPECTROSCOPY
ASTROPHYSICS
TABLE OF HARTREE-FOCK SELF CONSISTENT FIELD WAVE FUNCTIONS WITH EXCHANGE.
AD-619 428 DIV. 2

HELIUM
REPRINT: PHOTOIONIZATION CROSS SECTION OF HELIUM IN THE 100-TO 250-A REGION.
AD-619 533 DIV. 25

•ATROPINE
TOXICITY
ATROPINE DETOXICATION DURING HYPOTHERMIA BY THE ISOLATED PERFUSED RAT LIVER.
AD-619 068 DIV. 16

•AUDITORY PERCEPTION
MEASUREMENT
REPRINT: EVOKED RESPONSE LATENCY AS A FUNCTION OF STIMULUS RISE-TIME IN THE AUDITORY CORTEX.
AD-619 362 DIV. 16

REPTILES
REPRINT: AUDITORY RESPONSES IN THE ALLIGATOR LIZARD.
AD-619 339 DIV. 16
REPRINT: FURTHER STUDIES OF HEARING IN THE GEKKONID LIZARDS.
AD-619 340 DIV. 16

SPEECH RECOGNITION
REPRINT: SEMANTIC COMPONENTS OF THE QUALITY OF PROCESSED SPEECH.
AD-619 147 DIV. 28

•AUTOMATIC GAIN CONTROL
DIODES (SEMICONDUCTOR)
SILICON P-N JUNCTIONS AS AUTOMATIC GAIN CONTROL (AGC) ELEMENTS FOR VIDEO PULSES.
AD-619 280 DIV. 8

•AVALANCHE DIODES
PREPARATION
NEW CONCEPTS FOR SOLID STATE MICROWAVE GENERATORS: SURFACE CONTROLLED MICROWAVE AVALANCHE TRANSISTOR.
AD-619 000 DIV. 8

•AZIDES
COMPLEX COMPOUNDS
REPRINT: LEWIS ACID ADDUCTS OF GROUP IV-A AZIDES.
AD-613 920 DIV. 4

•BACILLUS ANTHRACIS
GUINEA PIGS
REPRINT: STUDIES ON ANTHRAX INFECTIONS IN IMMUNIZED GUINEA PIGS.
AD-614 321 DIV. 16

•BACKWARD-WAVE OSCILLATORS
MILLIMETER WAVES
GENERATION OF INFRAMILLIMETRIC WAVES BY MEANS OF ELECTRONIC BEAMS.
AD-614 124 DIV. 8

VERY HIGH FREQUENCY
RESEARCH ON ONE MILLIMETER C. W. CARCINOTRON.
AD-614 459 DIV. 8

•BACTERIA
METABOLISM
METABOLISM OF SIMPLE CARBON COMPOUNDS IN MICRO ORGANISMS.
AD-614 479 DIV. 16

•BALLISTICS
METEOROLOGICAL PARAMETERS
SOURCES OF METEOROLOGICAL DATA FOR WEAPONS SYSTEMS STUDIES.
AD-614 262 DIV. 22

•BALLOONS
SYMPOSIA
PROCEEDINGS OF THE AFCRL SCIENTIFIC BALLOON SYMPOSIUM, HELD AT BOSTON, MASSACHUSETTS, 25-27 SEPTEMBER 1963.
AD-614 068 DIV. 1

•BAND SPECTRUM
GADOLINIUM
REPRINT: BAND STRUCTURE AND MAGNETISM OF GADOLINIUM METAL.
AD-614 557 DIV. 25

•BAND-PASS AMPLIFIERS
DIODES (SEMICONDUCTOR)
MOLECULAR BANDPASS AMPLIFIERS.
AD-614 468 DIV. 8

•BAND-PASS FILTERS
QUARTZ
PEM FOR FILTER, QUARTZ CRYSTAL, 112 MC, TYPE EL-FR (X-2) AND CRYSTAL UNIT, FILTER, QUARTZ TYPES CR-(XM-69)/U AND CR-(XM-69)/U.
AD-614 223 DIV. 8

•BARBITURATES
DIFFUSION
REPRINT: THAM DIALYSIS: AN EXPERIMENTAL METHOD TO STUDY DIFFUSION OF CERTAIN WEAK ACIDS IN VIVIO. II. SECOBARBITAL.
AD-614 355 DIV. 16

•BARIUM COMPOUNDS
OXIDES
PHOTOELECTRIC EMISSION FROM BARIUM OXIDE.
AD-614 326 DIV. 25

•BARYONS
MESONS
REPRINT: MESON-BARYON SYSTEMS AND THEIR RESONANCES.
AD-614 152 DIV. 20

•BASALT
PHASE STUDIES
REPRINT: THE BASALT-ECLOGITE TRANSFORMATION AND CRUSTAL STRUCTURE IN THE WESTERN UNITED STATES.
AD-614 303 DIV. 2

•BATTERIES AND COMPONENTS
PRIMARY CELLS
THIN-PLATE BATTERY. SUPPLEMENT TO THIN-FILM MONOTRONICS.
AD-614 471 DIV. 7

•BEAMS (STRUCTURAL)
LOADING (MECHANICS)
SLOW BEND-TENSION TEST CORRELATIONS OF SHORT BEAMS WITH SPECIAL REFERENCE TO THE CHARPY-TYPE SPECIMEN.
AD-614 095 DIV. 30

VIBRATION
VIBRATIONS OF A BEAM ON AN ELASTIC FOUNDATION.
AD-614 072 DIV. 13

•BEARINGS
BONDED JOINTS
REPRINT: TRANSLATION OF CANADIAN RESEARCH. ULTRASONIC METHOD FOR EVALUATING BONDS IN LARGE METALLIC BEARINGS.
AD-614 207 DIV. 26

•BEHAVIOR
GROUP DYNAMICS
SOME DETERMINANTS OF SMALL-GROUP EFFECTIVENESS.
AD-613 954 DIV. 28

•BERYLLIUM
COMBUSTION
ESTIMATING METAL PARTICLE COMBUSTION KINETICS; ALUMINUM, BERYLLIUM, MAGNESIUM.
AD-614 563 DIV. 10

DEFORMATION
INVESTIGATION OF BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
AD-613 969 DIV. 17
BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
AD-614 086 DIV. 17
BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
AD-614 128 DIV. 17
BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
AD-614 129 DIV. 17
BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
AD-614 236 DIV. 17

POWDER METALLURGY
BERYLLIUM RESEARCH AND DEVELOPMENT PROGRAM. VOLUME VI. INFLUENCE OF THE DISTRIBUTION OF OXIDE AND THE TOTAL IMPURITY LEVEL ON RECRYSTALLIZATION AND GRAIN GROWTH OF BERYLLIUM.
AD-613 952 DIV. 17

•BIBLIOGRAPHIES
SOCIAL SCIENCES
SELECTED BIBLIOGRAPHY OF PUBLICATIONS, PAPERS, AND REPORTS IN THE SOCIAL, BEHAVIORAL, AND ADMINISTRATIVE SCIENCES.
AD-614 066 DIV. 32

•BINARY STARS
CELESTIAL MECHANICS
PROPER MOTIONS FOR EIGHTY WIDE DOUBLE STARS.
AD-614 129 DIV. 2

•BINOMIALS
DISTRIBUTION THEORY
SELECTION AND RANKING PROCEDURES AND ORDER STATISTICS FOR THE BINOMIAL DISTRIBUTION.
AD-614 070 DIV. 15

•BIOLOGICAL WARFARE AGENTS
UNITED STATES
TRANSLATION OF RUSSIAN ARTICLE: BIOLOGICAL WEAPONS OF THE 'IMPERIALISTIC' USA.
AD-614 404 DIV. 3

•BIONICS
MUSCLES
CORRELATIONAL STUDY OF MYOPOTENTIAL RESPONSE AND FORCE OF MUSCLE CONTRACTION DURING VARYING ACTIVITY DEMANDS.
AD-613 930 DIV. 30

•BISMUTH
SINGLE CRYSTALS
REPRINT: RAPID-FREEZE METHOD FOR GROWTH OF BISMUTH SINGLE CRYSTALS.
AD-614 318 DIV. 17

THERMAL CONDUCTIVITY
QUENCHING AND POST-IRRADIATION STUDIES ON CDS SINGLE CRYSTALS. TRANSPORT PROPERTIES OF BISMUTH ROLLED THIN FOILS.
AD-614 485 DIV. 25

•BISMUTH COMPOUNDS
OXIDES
APPLICATION OF FERRO- AND FERRIELECTRIC PHENOMENA IN COMPUTER DEVICES.
AD-614 010 DIV. 30

•BLOOD COAGULATION
INHIBITION
REPRINT: EFFECT OF DEXTRAN OF PLATELET FACTOR 3 ACTIVITY IN VITRO AND IN VIVO STUDIES.
AD-614 342 DIV. 16

•BLOOD GROUPS
AGGLUTININS
REPRINT: EVALUATION OF ELECTRONIC MEASUREMENTS OF HEMAGGLUTINATION FOR QUANTITATIVE STUDIES. I. LIMITATIONS IN THE APPLICATION OF INSTRUMENT MEASUREMENTS.
AD-614 344 DIV. 16

•BLOOD PLATELETS
DEXTRAN
REPRINT: EFFECT OF DEXTRAN OF PLATELET FACTOR 3 ACTIVITY IN VITRO AND IN VIVO STUDIES.
AD-614 342 DIV. 16

•BLOOD VOLUME
METABOLISM
REPRINT: METABOLIC RESPONSES DURING MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG.
AD-614 346 DIV. 16
REPRINT: MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG.
AD-614 347 DIV. 16

•BLUNT BODIES
HYPERSONIC FLOW
HYPERSONIC VISCOUS FLOW NEAR THE STAGNATION STREAMLINE OF A BLUNT BODY. A TEST OF LOCAL SIMILARITY.
AD-613 915 DIV. 9
HYPERSONIC VISCOUS FLOW NEAR THE STAGNATION STREAMLINE OF A BLUNT BODY. THIRD-ORDER BOUNDARY-LAYER THEORY AND COMPARISON WITH OTHER METHODS.
AD-613 916 DIV. 9

WAKE
EXPERIMENTAL STUDY OF LAMINAR NEAR WAKES.
AD-614 004 DIV. 9

•BODIES OF REVOLUTION
DRAG
SKIN FRICTION DRAG AND SHEAR STRESS DISTRIBUTION ON SEVERAL STREAMLINED BODIES OF REVOLUTION WITH VARIED FINENESS RATIO.
AD-614 237 DIV. 9

•BOILING WATER REACTORS
INSTRUMENTATION
RESPONSE OF REACTOR INSTRUMENTATION TO IN-CORE VOID FORMATIONS SIMULATING BOILING.
AD-614 037 DIV. 20

•BORON COMPOUNDS
FREE RADICALS
REPRINT: ARYL BORON FREE RADICALS.
AD-614 547 DIV. 4

•BOUNDARY LAYER
FLAT PLATE MODELS
TRANSLATION OF RUSSIAN RESEARCH: THE BOUNDARY LAYER ON A FLAT PLATE IN ANISOTROPIC MAGNETOHYDRODYNAMICS.
AD-614 391 DIV. 25

NUMERICAL ANALYSIS
HYPERSONIC VISCOUS FLOW NEAR THE STAGNATION STREAMLINE OF A BLUNT BODY. THIRD-ORDER BOUNDARY-LAYER THEORY AND COMPARISON WITH OTHER METHODS.
AD-613 916 DIV. 9

SCATTERING
MOLECULAR BEAM VELOCITY DISTRIBUTION MEASUREMENTS.
AD-614 230 DIV. 9

•BOUNDARY LAYER TRANSITION
AERODYNAMIC CHARACTERISTICS
DEVICE FOR THE DIRECT MEASUREMENT OF UNSTEADY AIR FLOWS AND SOME CHARACTERISTICS OF BOUNDARY LAYER TRANSITION.
AD-614 008 DIV. 9

•BOUNDARY VALUE PROBLEMS
MAGNETOHYDRODYNAMICS
THE FLOW OF A CONDUCTING GAS JET WITH ALIGNED MAGNETIC FIELD.
AD-614 420 DIV. 25

•BRAIN
STIMULATION
REPRINT: EVOKED ACTIVITY IN THE CAUDATE NUCLEUS OF THE CAT IN RESPONSE TO VARIOUS KINDS OF AFFERENT STIMULI. I. MACROPHYSIOLOGICAL STUDY.
AD-614 510 DIV. 16

•BUBBLES
STEAM
RESPONSE OF REACTOR INSTRUMENTATION TO IN-CORE VOID FORMATIONS SIMULATING BUILING.
AD-614 037 DIV. 20

•BUTYL RUBBER
POLYMERIZATION
REPRINT: ANIONIC POLYMERIZATION OF BUTADIENE AND STYRENE.
AD-614 498 DIV. 4

•CADMIUM
ELECTRONS
REPRINT: RESONANT ABSORPTION OF ULTRASOUND BY OPENORBIT ELECTRONS IN CADMIUM.
AD-614 372 DIV. 25

•CADMIUM ALLOYS
TELLURIUM ALLOYS
REPRINT: PARTIAL PRESSURES AND GIBBS FREE ENERGY OF FORMATION FOR CONGRUENTLY SUBLIMING CDTE(C).
AD-614 292 DIV. 25

•CADMIUM COMPOUNDS
SULFIDES
QUENCHING AND POST-IRRADIATION STUDIES ON CDS SINGLE CRYSTALS. TRANSPORT PROPERTIES OF BISMUTH ROLLED THIN FOILS.
AD-614 488 DIV. 25
REPRINT: TUNNELING PROCESSES ACROSS THE CDS-ELECTROLYTE INTERFACE.
AD-614 494 DIV. 25

•CALCIFICATION
PHOSPHORESCENCE
REPRINT: PHOSPHORESCENCE OF CALCIFIED TISSUES.
AD-614 210 DIV. 16

•CALCIUM
NUCLEAR SCATTERING
ELECTRON SCATTERING ON NUCLEONS, THREE-BODY NUCLEI, AND CA40.
AD-614 270 DIV. 20

•CALCULUS OF VARIATIONS
ELASTICITY
LINEAR EQUATIONS OF ANISOTROPIC ELASTIC PLATES.
AD-614 132 DIV. 25

•CANCER
HISTOLOGY
REPRINT: DIFFERENTIATION OF NEVOID BASAL CELL CARCINOMA FROM EPITHELIOMA ADENOIDES CYSTICUM: A CLINICOPATHOLOGIC AND HISTOCHEMICAL STUDY.
AD-614 253 DIV. 16

•CARBON
CHEMISORPTION
BASIC STUDY OF GAS-SOLID INTERACTIONS: I. INTERACTION OF HYDROGEN WITH PLATINIZED CARBON.
AD-614 041 DIV. 4

•CARBON DIOXIDE
GAS ANALYSIS
DEVELOPMENT OF A CARBON DIOXIDE PARTIAL PRESSURE SENSOR.
AD-614 226 DIV. 16

•CARBONATES
ALKALINE CELLS
EFFECT OF CARBONATED ELECTROLYTE ON THE PERFORMANCE OF SINTERED PLATE NICKEL-CADMIUM CELLS.
AD-614 104 DIV. 7

•CARDIOVASCULAR DISEASES
OXYGEN CONSUMPTION
REPRINT: METABOLIC RESPONSES DURING MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG.
AD-614 246 DIV. 16
REPRINT: MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG.
AD-614 247 DIV. 16

•CASTINGS
HEAT TREATMENT
HOMOGENIZATION OF HIGH-STRENGTH STEEL AT 2500 F.
AD-614 277 DIV. 26

•CATHODE RAY TUBES
FIBER OPTICS
< INCH DIAMETER CATHODE RAY TUBE WITH FIBER OPTIC FACE= PLATE.
AD-614 448 DIV. 8

•CATHODIC PROTECTION
SHIP HULLS
REPRINT: PROBLEMS OF ADHESION WITH CATHODIC PROTECTION.
AD-614 551 DIV. 4

•CELESTIAL MECHANICS
BINARY STARS
PROPER MOTIONS FOR EIGHTY WIDE DOUBLE STARS.
AD-614 135 DIV. 2

N-BODY PROBLEM
REPRINT: SOME PERIODIC SOLUTIONS OF A FOUR-BODY PROBLEM.
AD-614 295 DIV. 2

•CELESTIAL NAVIGATION
AIRCRAFT
NAVIGATIONAL CAPABILITY FOR PROGRAM 665A WITH AN/ASN24V(MOD) DIGITAL COMPUTER.
AD-613 941 DIV. 19

STAR TRACKERS
EXPERIMENTAL VERIFICATION OF STAR IDENTIFICATION BY OPTICAL RADIATION ANALYSIS.
AD-614 238 DIV. 19

•CERAMIC MATERIALS
CRYSTAL GROWTH
HYDROTHERMAL GROWTH OF CRYSTALS OF LAALO3.
AD-614 229 DIV. 14

DIELECTRIC PROPERTIES
MICROWAVE NONLINEAR DIELECTRIC MATERIALS.
AD-614 274 DIV. 14

FRACTURE (MECHANICS)
FABRICATION AND FRACTURE OF POLYCRYSTALLINE NIO.
AD-614 263 DIV. 14

MACHINING
MACHINING HIGH PURITY ALUMINA.
AD-614 467 DIV. 26

MECHANICAL PROPERTIES
MECHANICAL BEHAVIOR OF POLYCRYSTALLINE CERAMICS.
AD-614 265 DIV. 14

MICROSTRUCTURE
MICROSTRUCTURE IN STRUCTURAL CERAMICS.
AD-614 076 DIV. 14

•CESIUM
SPECIFIC HEAT
SPECIFIC HEATS BELOW 320K OF POTASSIUM, RUBIDIUM AND CAESIUM.
AD-614 520 DIV. 25

•CESIUM ELECTRON TUBES
MANUFACTURING METHODS
PRODUCTION ENGINEERING MEASURE FOR CESIUM BEAM TUBES.
AD-614 118 DIV. 8

•CHARGED PARTICLES
FIELD THEORY
REPRINT: FALLING ELECTRICALLY CHARGED PARTICLES.
AD-614 166 DIV. 25

•CHECKOUT PROCEDURES
AUTOMATION
GROWTH OF AUTOMATION IN PRELAUNCH CHECKOUT FOR SPACE VEHICLES.
AD-614 410 DIV. 12

PROGRAMMING (COMPUTERS)
COMPUTER ALGORITHM FOR FAULT ISOLATION AND TEST POINT SELECTION.
AD-613 960 DIV. 8

•CHEMICAL WARFARE AGENTS
UNITED STATES
TRANSLATION OF RUSSIAN ARTICLE: CHEMICAL WEAPONS OF THE 'IMPERIALISTIC' U. S.
AD-614 392 DIV. 3

•CHEMISORPTION
CARBON
BASIC STUDY OF GAS-SOLID INTERACTIONS: I. INTERACTION OF HYDROGEN WITH PLATINIZED CARBON.
AD-614 041 DIV. 4

•CHEMISTRY
INFRARED SPECTROSCOPY
REPRINT: INFRARED SPECTROSCOPY... WHERE DO WE GO FROM HERE.
AD-614 504 DIV. 25

•CHLORIDES
SODIUM COMPOUNDS
MECHANICAL PROPERTIES OF POLYCRYSTALLINE SODIUM CHLORIDE.
AD-614 054 DIV. 25

•CIRCUIT
THEORY
REPRINT: A SYMBOLIC NOTATION APPLIED TO UNBALANCED LADDER NETWORKS.
AD-614 141 DIV. 8

•CIRCUITS
AMPLIFIERS
REPRINT: OPERATIONAL AMPLIFIER CIRCUITS FOR CONTROLLED POTENTIAL CYCLIC VOLTAMMETRY, II.
AD-614 195 DIV. 4

ELECTRON TUBES
REPRINT: A NOTE ON ACTIVE RC REALIZATION OF VOLTAGE TRANSFER FUNCTIONS.
AD-614 554 DIV. 8

THEORY
REPRINT: SINGULAR NETWORK ELEMENTS.
AD-613 919 DIV. 8

•CIVIL DEFENSE SYSTEMS
THREAT EVALUATION
THREAT PERCEPTION AND CIVIL DEFENSE.
AD-614 386 DIV. 18

•CLAY
COMPRESSIVE PROPERTIES
STUDY OF THE BEHAVIOR OF SOIL AND ROCK SUBJECTED TO HIGH STRESS LEVELS.
AD-614 481 DIV. 13

•CLIMATOLOGY
USSR
TRANSLATION OF RUSSIAN RESEARCH: CLIMATE OF THE FREE ATMOSPHERE.
AD-613 988 DIV. 2

•CLOSED ECOLOGICAL SYSTEMS
SPACE FLIGHT
TRANSLATION OF RUSSIAN RESEARCH: HIBERNATION OF SPACE CREWS ON LONG SPACE FLIGHTS.
AD-614 394 DIV. 16

•CLOSTRIDIUM TETANI
TOXINS AND ANTITOXINS
REPRINT: ROLE OF GANGLIOSIDE IN THE MODE OF ACTION OF TETANUS TOXIN.
AD-614 202 DIV. 16

•COBALT
CHEMICAL PRECIPITATION
TRANSLATION OF RUSSIAN RESEARCH. SETTLING-OUT OF COBALT FROM LEAN SOLUTIONS WITH SODIUM SULFIDE.
AD-614 405 DIV. 17

•COBALT COMPOUNDS
ANOMALIES
REPRINT: MAGNETIC AND ELECTRICAL ANOMALIES IN LaCoO3.
AD-614 216 DIV. 25

METALORGANIC COMPOUNDS
REPRINT: CYCLOPENTADIENYLCOBALT CARBONYL DIIODIDE.
AD-614 540 DIV. 4

•CODING
COMMUNICATION THEORY
FACTORS AFFECTING CODING ERRORS.
AD-614 418 DIV. 8

•COILS
MANUFACTURING METHODS
PRODUCTION OF INTENSE MAGNETIC FIELDS BY MEANS OF LIQUID NITROGEN COOLED COPPER COILS.
AD-613 967 DIV. 25

•COLLOIDS
PARTICLE BEAMS
PARTICLE GROWTH IN THE IONIC NUCLEATION CONDENSATION COLLOIDAL ION SOURCE.
AD-614 111 DIV. 27

SOAPS
REPRINT: SOAP FILMS AND SOME PROBLEMS IN SURFACE AND COLLOID CHEMISTRY.
AD-614 293 DIV. 4

•COLOR CENTERS
EXCITATION
EXCITON ABSORPTION IN THE PRESENCE OF EXCITED F-CENTERS.
AD-614 487 DIV. 25

•COLOR PHOTOGRAPHY
ILLUMINATION
TRANSLATION OF REPORT ON RUSSIAN RESEARCH FOR HIGH-SPEED COLOR PHOTOGRAPHY OF SELF-ILLUMINATING PROCESSES.
AD-614 398 DIV. 24

•COLOR VISION
MONKEYS
CODING AND TRANSMISSION IN THE VISUAL SYSTEM.
AD-614 486 DIV. 16

VISUAL PERCEPTION
REPRINT: MAINTAINING AN ABSOLUTE HUE IN THE PRESENCE OF DIFFERENT BACKGROUND COLORS.
AD-614 199 DIV. 16

•COMBAT INFORMATION CENTERS
DECISION MAKING
TARGET CAPABILITY VERSUS PRESUMED INTENTION AS A BASIS FOR DECISION IN COMBAT INFORMATION CENTERS.
AD-613 944 DIV. 5

•COMBINATORIAL ANALYSIS
ALGEBRAIC TOPOLOGY
REPRINT: PRODUCTS BETWEEN HOMOTOPY GROUPS AND THE J-MORPHISM.
AD-614 157 DIV. 15

LINEAR PROGRAMMING
MULTIPHASE-DUAL ALGORITHM FOR THE ZERO-ONE INTEGER PROGRAMMING PROBLEM.
AD-614 121 DIV. 15

•COMBUSTION
POWDER METALS
ESTIMATING METAL PARTICLE COMBUSTION KINETICS; ALUMINUM, BERYLLIUM, MAGNESIUM.
AD-614 563 DIV. 10

•COMBUSTION CHAMBERS
PRESSURE
TRANSIENT CHAMBER PRESSURE AND THRUST IN SOLID ROCKET MOTORS.
AD-613 962 DIV. 27

•COMMAND AND CONTROL SYSTEMS
RELIABILITY (ELECTRONICS)
ELECTRONIC SYSTEMS DIVISION. RELIABILITY/MAINTAINABILITY PROGRAM ELEMENTS.
AD-614 423 DIV. 18

•COMMERCE
LAW
REPORT OF THE ATTORNEY GENERAL, PURSUANT TO SECTION 10(C) OF THE SMALL BUSINESS ACT OF 1958 AS AMENDED.
AD-614 479 DIV. 18

THEORY
REVIEW OF THE THEORY OF CUSTOMS UNIONS.
AD-614 407 DIV. 32

•COMMUNICATION SATELLITES (PASSIVE)
DIPOLE ANTENNAS
REPRINT: LONG RANGE COMMUNICATION BY ORBITING DIPOLE BELTS.
AD-614 214 DIV. 5

•COMMUNICATION SYSTEMS
REVIEWS
VERY LOW FREQUENCY PROPAGATION; ELECTRON AND SOLID STATE PHYSICS; AUTOMATIC CONTROL; COMMUNICATIONS AND NETWORKS; ELECTROMAGNETIC RADIATION.
AD-614 130 DIV. 30

•COMMUNICATION THEORY
CODING
FACTORS AFFECTING CODING ERRORS.
AD-614 418 DIV. 8

DIGITAL SYSTEMS
DIGITAL COMMUNICATION OVER FIXED TIME-CONTINUOUS CHANNELS WITH MEMORY, WITH SPECIAL APPLICATION TO TELEPHONE CHANNELS.
AD-614 110 DIV. 8

PATTERN RECOGNITION
RESTORATION OF OPTICAL PATTERNS WHICH HAVE BEEN DISTORTED BY DIFFRACTION AND NOISE.
AD-614 272 DIV. 30

SPEECH RECOGNITION
IDENTIFICATION OF ELEMENTARY AUDITORY DISPLAYS: EFFECT OF UNBALANCED PROBABILITIES OF OCCURRENCE.
AD-614 297 DIV. 8

•COMPLEX COMPOUNDS
AZIDES
REPRINT: LEWIS ACID ADDUCTS OF GROUP IV-A AZIDES.

AD-613 920 DIV. 4

•COMPOSITE MATERIALS
BEARINGS
REPRINT: TRANSLATION OF CANADIAN RESEARCH. ULTRASONIC METHOD FOR EVALUATING BONDS IN LARGE METALLIC BEARINGS.
AD-614 307 DIV. 26

FILAMENT WOUND CONSTRUCTION
INTERLAMINAR SHEAR OF FILAMENT-WOUND REINFORCED PLASTICS.
AD-613 997 DIV. 14

SEMICONDUCTORS
ELECTRICAL AND ELECTRO-OPTICAL PROPERTIES OF INTERFACE ALLOY HETEROJUNCTIONS.
AD-614 320 DIV. 25

•COMPUTER LOGIC
FERROELECTRIC CRYSTALS
APPLICATION OF FERRO- AND FERRIELECTRIC PHENOMENA IN COMPUTER DEVICES.
AD-614 010 DIV. 30

•COMPUTER STORAGE DEVICES
FERROELECTRIC CRYSTALS
APPLICATION OF FERRO- AND FERRIELECTRIC PHENOMENA IN COMPUTER DEVICES.
AD-614 010 DIV. 30

•CONDENSATION REACTIONS
FERROCENES
REPRINT: RING METALATION OF DIMETHYLAMINOMETHYLFERROCENE WITH BUTYLLITHIUM AND CONDENSATIONS WITH ELECTROPHILIC COMPOUNDS. SYNTHESIS OF 1,2-DISUBSTITUTED FERROCENES.
AD-614 544 DIV. 4

•CONICAL BODIES
HYPERSONIC FLOW
A CONICAL THIN-SHOCK-LAYER THEORY UNIFORMLY VALID IN THE ENTROPY LAYER.
AD-614 444 DIV. 9

INCOMPRESSIBLE FLOW
REPRINT: THE VISCOUS INCOMPRESSIBLE FLOW INSIDE A CONE.
AD-614 492 DIV. 9

WAKE
EXPERIMENTAL STUDY OF LAMINAR NEAR WAKES.
AD-614 004 DIV. 9

•CONTINUUM MECHANICS
THEORY
STUDIES IN THE THEORY OF A DISLOCATED CONTINUUM.
AD-614 225 DIV. 25

•CONTROL SYSTEMS
AUTOMATIC
VERY LOW FREQUENCY PROPAGATION; ELECTRON AND SOLID STATE PHYSICS; AUTOMATIC CONTROL; COMMUNICATIONS AND NETWORKS; ELECTROMAGNETIC RADIATION.
AD-614 120 DIV. 30

STABILITY
REPRINT: STABILITY CRITERION FOR PULSE-WIDTH-MODULATED FEEDBACK CONTROL SYSTEMS.
AD-614 489 DIV. 30

•CONTROLLED ATMOSPHERES
SUBMARINES
PRESENT STATUS OF CHEMICAL RESEARCH IN ATMOSPHERE PURIFICATION AND CONTROL ON NUCLEAR-POWERED SUBMARINES.
AD-614 261 DIV. 31

•COPPER ALLOYS
ATOMIC ENERGY LEVELS
ELECTRONIC STRUCTURE OF DILUTE SOLID SOLUTION ALLOYS OF 3DTRANSITION METALS IN A NON-MAGNETIC MATRIX.
AD-614 482 DIV. 25

CRYSTAL LATTICE DEFECTS
STRUCTURE OF DEFORMED INTERNALLY OXIDIZED ALLOYS.
AD-614 080 DIV. 17

RECRYSTALLIZATION
INFLUENCE OF A FINELY DISPERSED SECOND PHASE ON RECRYSTALLIZATION. ANNEALING BEHAVIOR OF INTERNALLY OXIDIZED ALLOYS OF SILVER CONTAINING MAGNESIUM AND COPPER CONTAINING ALUMIUM.
AD-613 971 DIV. 17

•CORROSION
PIPES
PIPE CORROSION AT NAVAL ACTIVITIES.
AD-614 259 DIV. 13

STRESSES
STRESS-CORROSION CRACKING OF ALUMINUM ALLOYS.
AD-613 957 DIV. 17

•COSMIC RAY BURSTS
DIFFUSION
AN INTERPLANETARY DIFFUSION MODEL FOR THE TIME BEHAVIOR OF INTENSITY IN A SOLAR COSMIC RAY EVENT.
AD-614 100 DIV. 2

•COSMIC RAYS
ATMOSPHERIC REFRACTION
REPRINT: ISOTROPY OF COSMIC RADIATION.
AD-614 381 DIV. 2

NUCLEI
REPRINT: COSMIC-RAY HEAVY NUCLEI AT THE GEOMAGNETIC EQUATOR.
AD-614 549 DIV. 20

RADIATION MEASUREMENT SYSTEMS
TRANSLATIONS OF RUSSIAN RESEARCH: INVESTIGATIONS OF RADIATIONS ON MAN-MADE EARTH SATELLITE COSMOS-17.
AD-614 402 DIV. 12

•COSTS
MANAGEMENT CONTROL SYSTEMS
COST ACCOUNTING PROBLEMS IN THE PERT COST SYSTEM.
AD-614 408 DIV. 26

•COTTON TEXTILES
DEGRADATION
REPRINT: EFFECT OF NONCELLULOSIC MATERIALS (COPPER AND NICKEL OXINATES) ON ACTINIC DEGRADATION OF COTTON FABRIC.
AD-614 499 DIV. 14

•COUMARINS
BIOSYNTHESIS
REPRINT: BIOSYNTHESIS OF THE COUMARINS. VI. FURTHER STUDIES ON HERNIARIN FORMATION IN LAVENDER.
AD-614 511 DIV. 16

•COUPLED ANTENNAS
DESIGN
INVESTIGATION OF A MULTIPLE BEAM SCANNING CIRCULAR ARRAY.
AD-614 288 DIV. 8

•CREEP
ALLOYS
DIMENSIONAL STABILITY OF SELECTED ALLOY SYSTEMS.
AD-613 931 DIV. 17

•CROSSED FIELD DEVICES
MICROWAVE AMPLIFIERS
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-613 994 DIV. 8
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-613 995 DIV. 8
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-614 055 DIV. 8
DEVELOPMENT OF AN X-BAND CW CROSSED-FIELD AMPLIFIER.
AD-614 251 DIV. 8

•CRYOGENICS
HYDRODYNAMICS
GREEN'S FUNCTIONS AND SUPERFLUID HYDRODYNAMICS.
AD-614 044 DIV. 25

MAGNETIC FIELDS
PRODUCTION OF INTENSE MAGNETIC FIELDS BY MEANS OF LIQUID NITROGEN COOLED COPPER COILS.
AD-613 967 DIV. 25

MATHEMATICAL ANALYSIS
MIT SOLID-STATE AND MOLECULAR THEORY GROUP PROGRESS REPORT.
AD-613 996 DIV. 25

MOLECULAR BEAMS
REPRINT: BEAMS OF HELIUM ATOMS AT TEMPERATURES BELOW 0.5 K.
AD-614 373 DIV. 25

•CRYSTAL GROWTH
CRYSTAL LATTICE DEFECTS
TRANSLATION OF RUSSIAN RESEARCH: GROWTH OF SINGLE CRYSTALS NEMATIC FILMS.
AD-613 984 DIV. 25

DIAMONDS
ANALYTICAL STUDY OF THE THERMODYNAMIC FACTORS CONTROLLING DIAMOND SYNTHESIS AND GROWTH AT HIGH PRESSURES AND TEMPERATURES.
AD-614 082 DIV. 25

FREEZING
REPRINT: RAPID-FREEZE METHOD FOR GROWTH OF BISMUTH SINGLE CRYSTALS.
AD-614 318 DIV. 17

LANTHANUM COMPOUNDS
HYDROTHERMAL GROWTH OF CRYSTALS OF LAALO3.
AD-614 229 DIV. 14

LIQUIDS
TRANSLATION OF RUSSIAN RESEARCH: TYPE OF GROWTH AND PROPERTIES OF LIQUID CRYSTALS OF THIAZINE DYES.
AD-613 985 DIV. 25

RARE EARTH COMPOUNDS
GROWTH AND CHARACTERIZATION OF SINGLE CRYSTALS OF RARE EARTH COMPOUNDS.
AD-614 435 DIV. 25

•CRYSTAL HOLDERS
MANUFACTURING METHODS
PRODUCTION ENGINEERING MEASURE FOR TYPE CR-(XM-60)/U CRYSTAL UNITS.

AD-614 074 DIV. 8

•CRYSTAL LATTICE DEFECTS
FILMS
TRANSLATION OF RUSSIAN RESEARCH: GROWTH OF SINGLE CRYSTALS NEMATIC FILMS.
AD-613 984 DIV. 25

•CRYSTAL LATTICES
DEFORMATION
REPRINT: THE EFFECT OF STRAIN ON THE EXCITON SPECTRUM OF GERMANIUM.
AD-614 200 DIV. 25

ELECTRON TRANSITIONS
MIT SOLID-STATE AND MOLECULAR THEORY GROUP PROGRESS REPORT.
AD-613 996 DIV. 25

NEUTRON DEFRACTION ANALYSIS
REPRINT: NEUTRON DIFFR ACTION STUDIES OF THE ORDER OF THE ATOMS IN THE P PHASE AND THE R PHASE.
AD-614 149 DIV. 25

•CRYSTAL STRUCTURE
ANALYSIS
ANALOG COMPUTERS FOR X-RAY CRYSTAL ANALYSIS.
AD-613 925 DIV. 30

LIQUIDS
TRANSLATION OF RUSSIAN RESEARCH: VITRIFIED LIQUID CRYSTAL FILMS.
AD-613 986 DIV. 25

MARTINSITE
THERMODYNAMICS OF MARTENSITIC F. C. C. REVERSIBLY YIELDS B. C. C. AND F. C. C. REVERSIBLY YIELDS H. C. P. TRANSFORMA TIONS IN THE IRON-RUTHENIUM SYSTEM.
AD-614 009 DIV. 17

SILICIDES
REPRINT: POLYMORPHISM OF RARE EARTH DISILICIDES.
AD-614 137 DIV. 25

•CRYSTALS
FIELD THEORY
REPRINT: CALCULATION OF CRYSTAL-FIELD ENERGY-LEVEL SPLITTINGS OF THE TI(3) ION IN RBAI(SO4)2.12H 2O.
AD-614 357 DIV. 25

IONS
PROPERTIES OF CONDUCTION ELECTRONS IN IONIC CRYSTALS.
AD-614 091 DIV. 25

ORGANIC COMPOUNDS
REPRINT: PHOTOGENERATION OF FREE CARRIERS IN ORGANIC CRYSTALS VIA EXCITON-EXCITON INTERACTIONS.
AD-614 385 DIV. 25

SEMICONDUCTOR DEVICES
PRODUCTION ENGINEERING MEASURE FOR TYPE CR-(XM-60)/U CRYSTAL UNITS.
AD-614 074 DIV. 8

•CULTURE MEDIA
ENTERBACTERIACEAE
REPRINT: FIELD TRIAL OF A NEW TRANSPORT MEDIUM FOR COLLECTION OF FECES FOR BACTERIOLOGIC EXAMINATION.
AD-614 191 DIV. 16

•CURVED PROFILES
TESTS
REPRINT: VISUAL SPACE: A TEST OF THE CONSTANT CURVATURE HYPOTHESIS.
AD-614 363 DIV. 28

•CUTTING TOOLS
CONTROL SYSTEMS
TRANSLATION OF RUSSIAN PATENT ON SELF-ADJUSTING SYSTEM FOR PROGRAMMED CONTROL OF METAL-CUTTING MACHINE TUOLS.
AD-614 022 DIV. 30

•CYANOGEN
ELECTRON TRANSITIONS
REPRINT: OPTICAL DETECTION OF MICROWAVE TRANSITIONS BETWEEN EXCITED ELECTRONIC STATES OF CN AND THE IDENTIFICA TION OF THE TRANSITIONS INVOLVED.
AD-614 553 DIV. 25

LASERS
REPRINT: LASER POSSIBI LITIES OF CHEMICALLY EXCITED MOLECULES FORMED WITH ATOMIC SPECIES.
AD-614 224 DIV. 25

•CYCLOBUTENES
PHOTOCHEMISTRY
REPRINT: PHOTOCHEMICAL ADDITION OF HYDROGEN BROMIDE TO 2-BUTENE IN THE GAS PHASE.
AD-614 508 DIV. 4

•CYCLOHEXENES
MOLECULAR PROPERTIES
REPRINT: LCAO-MO SCF CALCULATIONS OF C606 SYSTEMS.
AD-614 192 DIV. 4

•CYCLOPENTANES
COBALT COMPOUNDS
REPRINT: CYCLOPENTADIEN YLCOBALT CARBONYL DIIODIDE.
AD-614 540 DIV. 4

DISSOCIATION
REPRINT: FREE RADICALS BY MASS SPECTROSCOPY: THERMAL DECOMPOSITION OF CYCLOPENTYL RADICALS.
AD-614 505 DIV. 4

SYNTHESIS (CHEMISTRY)
REPRINT: NONBENZENOID AROMATIC SYSTEMS: SYNTHESIS OF 1-VINYLAZULENE AND SUBSTITUTED 1-VINYLAZULENES.
AD-614 491 DIV. 4

•CYCLOTRON WAVES
POWER AMPLIFIERS
FREQUENCY AND POWER CONVERSION PROPERTIES OF CYCLOTRON WAVES.
AD-614 123 DIV. 8

•CYLINDRICAL BODIES
MOTION
REPRINT: INFLUENCE OF BOUNDARY CONDITIONS ON THE MODAL CHARACTERISTICS OF THIN CYLINDRICAL SHELLS.
AD-614 371 DIV. 25

•DATA PROCESSING SYSTEMS
EXTRATERRESTIAL RADIO WAVES
DIGITIZING RIOMETER SYSTEM.
AD-614 247 DIV. 30

FILTERS (ELECTROMAGNETIC WAVE)
DIGITAL FILTERS FOR DATA PROCESSING.
AD-614 033 DIV. 30

PHOTOGRAPHIC INTELLIGENCE
DEVELOPMENT OF AN ELECTRONIC DATA PROCESSING MODULE FOR MOBILE WING RECONNAISSANCE TECHNICAL SQUADRON.
AD-614 239 DIV. 18

•DATA TRANSMISSION SYSTEMS
NOISE
IMPULSE NOISE AND ERROR PERFORMANCE IN DATA TRANSMISSION IN TELEPHONE COMMUNICATION SYSTEMS.
AD-614 916 DIV. 5

TELEPHONE LINES
DIGITAL COMMUNICATION OVER FIXED TIME-CONTINUOUS CHANNELS WITH MEMORY, WITH SPECIAL APPLICATION TO TELEPHONE CHANNELS.
AD-614 110 DIV. 8

TELETYPE SYSTEMS
SATELLITE CONTROL FACILITY, DESIGN CRITERIA: DIRECT CONNECTION FOR CDC-160A COMPUTER TO TELETYPE TRANSMISSION LINES.
AD-614 002 DIV. 12

•DECABORANES
TOXICITY
REPRINT: METHYLENE BLUE IN THE TREATMENT OF DECABORANE TOXICITY.
AD-614 333 DIV. 16

•DECAY SCHEMES
FERMIONS
REPRINT: SCATTERING, WEAK DECAYS, AND FINAL-STATE INTERACTIONS IN MODEL THEORIES IN A DRESSED-PARTICLE PICTURE.
AD-614 375 DIV. 20

LITHIUM
REPRINT: DETERMINATION OF THE SPIN OF LITHIUM 8 HYPER NUCLEUS.
AD-614 187 DIV. 20

MESONS
REPRINT: THE PHI-OMEGA MIXING ANGLE.
AD-614 171 DIV. 20

NUCLEI
REPRINT: SOME POSSIBILITIES FOR UNUSUAL LIGHT HYPERNUCLEI.
AD-614 539 DIV. 20

•DECISION MAKING
HUMANS
EVALUATION OF TECHNIQUES AND DEVICES AS APPLIED TO PROBLEM SOLVING.
AD-614 228 DIV. 30

PROBABILITY
HUMAN PROCESSING OF EQUIVOCAL INFORMATION.
AD-613 949 DIV. 28

•DECISION THEORY
DETECTION
THEORY OF SIGNAL DETECTAB ILITY: COMPOSITE DEFERRED DECISION THEORY.
AD-614 480 DIV. 8

STOCHASTIC PROCESSES
TRANSLATION OF RUSSIAN RESEARCH: ON THE THEORY OF RANDOM FUNCTIONS AND THE CONTROL OF PROCESSES ON THE BASIS OF INCOMPLETE DATA.
AD-613 974 DIV. 15

•DEFICIENCY DISEASES
RADIOGRAPHY
IMPORTANCE AND RELIABILITY OF THE ROENTGENOGRAPHIC EXAM INATION OF THE SMALL BOWEL IN PATIENTS WITH TROPICAL SPRUE.
AD-613 918 DIV. 16

•DEFORMATION
STRUCTURES
REPRINT: THE SIGNIFICANCE OF SINGULAR CONFIGURATIONS OF STRUCTURES FROM THE STRENGTH OF MATERIALS POINT OF VIEW.
AD-614 941 DIV. 25

•DENTISTRY
POLAR REGIONS
REPRINT: DENTAL OBSERV ATIONS MADE WHILE WINTERING IN ANTARCTICA IN 1956-1957.
AD-614 319 DIV. 16

•DESOXYRIBONUCLEIC ACIDS
MUSTARD AGENTS
ELIMINATION OF SULFUR MUSTARD-INDUCED ALKYLATION PRODUCTS FROM DNA OF ESCHERICHIA COLI.
AD-614 267 DIV. 16

•DEUTERIUM
SUBSTITUTION REACTIONS
REPRINT: VIBRATIONAL EXCITATION IN SOME FOUR-CENTER TRANSITION STATES.
AD-614 548 DIV. 4

•DEUTERONS
PHOTON BOMBARDMENT
PHOTODISINTEGRATION OF THE DEUTERON BY POLARIZED PHOTONS.
AD-614 276 DIV. 20

•DEXTRAN
BLOOD COAGULATION
REPRINT: EFFECT OF DEXTRAN OF PLATELET FACTOR 3 ACTIVITY IN VITRO AND IN VIVO STUDIES.
AD-614 342 DIV. 16

•DE-ICING MATERIALS
REVIEWS
SURVEY OF SNOW AND ICE REMOVAL TECHNIQUES.
AD-614 931 DIV. 33

•DIAMONDS
SYNTHESIS
ANALYTICAL STUDY OF THE THERMODYNAMIC FACTORS CONTROLLING DIAMOND SYNTHESIS AND GROWTH AT HIGH PRESSURES AND TEMPERATURES.
AD-614 082 DIV. 25

•DIATOMIC MOLECULES
ABSORPTION SPECTRUM
REPRINT: CHARGE-TRANSFER ABSORPTION SPECTRA OF NO IN KR AND CH3OH SOLUTIONS.
AD-614 552 DIV. 25

•DIELECTRIC PROPERTIES
MICROWAVE SPECTROSCOPY
DIELECTRIC DISPERSION: MICROWAVE SPECTROMETER MODIFI CATIONS.
AD-613 939 DIV. 25

•DIELECTRICS
ANTENNAS
STUDY OF SPECIAL BEAMSHAPING ANTENNAS. INVESTIGATION OF DIELECTRIC ELEMENTS FOR LIGHTWEIGHT, TRANSPORTABLE SATELLITE COMMUNICATIONS ANTENNAS.
AD-613 932 DIV. 8

MATERIALS
MICROWAVE NONLINEAR DIELECTRIC MATERIALS.
AD-614 274 DIV. 14

•DIFS
FORGING
TRANSLATION OF RUSSIAN RESEARCH: NEW 5KHGSVF FORGING STEEL.
AD-614 390 DIV. 17

•DIFFERENTIAL EQUATIONS
PHASE SHIFT
REPRINT: PHASE-SHIFT EQUATIONS FOR MANY-CHANNEL PROBLEMS.
AD-614 167 DIV. 20

•DIFFERENTIAL GEOMETRY
CONTINUUM MECHANICS
STUDIES IN THE THEORY OF A DISLOCATED CONTINUUM.
AD-614 225 DIV. 25

RELATIVITY THEORY
SURVEY OF PUBLISHED LITERATURE ON THE HISTORICAL DEVELOPMENT OF SPINOR THEORY IN RIEMANNIAN GEOMETRY.
AD-614 049 DIV. 25

•DIFFUSION
SULFUR
REPRINT: DIFFUSION OF SULFUR 35 IN SINGLE CRYSTALS OF LEAD SULFIDE AS A FUNCTION OF STOICHIOMETRY AND DOPING ADDITIONS.
AD-614 550 DIV. 25

TRACER STUDIES
REPRINT: DIFFUSION IN ORGANIC CRYSTALS. SELF-DIFFUSION IN ANTHRACENE.
AD-614 531 DIV. 25

•DIGITAL COMPUTERS
DATA TRANSMISSION SYSTEMS
SATELLITE CONTROL FACILITY, DESIGN CRITERIA: DIRECT CONNECTION FOR CDC-160A COMPUTER TO TELETYPE TRANSMISSION LINES.
AD-614 002 DIV. 12

PHOTOINTERPRETATION
DEVELOPMENT OF AN ELECTRONIC DATA PROCESSING MODULE FOR MOBILE WING RECONNAISSANCE TECHNICAL SQUADRON.
AD-614 239 DIV. 18

•DIGITAL SYSTEMS
DATA TRANSMISSION SYSTEMS
DIGITAL COMMUNICATION OVER FIXED TIME-CONTINUOUS CHANNELS WITH MEMORY, WITH SPECIAL APPLICATION TO TELEPHONE CHANNELS.
AD-614 110 DIV. 8

•DIODES (SEMICONDUCTOR)
BANDPASS AMPLIFIERS
MOLECULAR BANDPASS AMPLIFIERS.
AD-614 468 DIV. 8

FREQUENCY MULTIPLIERS
MICROWAVE SOLID-STATE GENERATORS.
AD-614 047 DIV. 8

HYSTERESIS
REPRINT: HOT-ELECTRON LOSS VIA WIGGLED AUGER RECOMBI NATION IN SEMICONDUCTORS.
AD-614 358 DIV. 25

RECTIFIERS
PRODUCTION ENGINEERING MEASURE. HIGH VOLTAGE SILICON RECTIFIER STACKS.
AD-614 446 DIV. 8

SILICON
SILICON P-N JUNCTIONS AS AUTOMATIC GAIN CONTROL (AGC) ELEMENTS FOR VIDEO PULSES.
AD-614 280 DIV. 8

•DIPOLE ANTENNAS
COMMUNICATION SATELLITES (PASSIVE)
REPRINT: LONG RANGE COMMUNICATION BY ORBITING DIPOLE BELTS.
AD-614 214 DIV. 5

•DISPLAY SYSTEMS
RENDEZVOUS SPACECRAFT
PILOT DISPLAY CONCEPT FOR NEAR-TARGET MANEUVERS DURING SPACE FLIGHT RENDEZVOUS.
AD-613 958 DIV. 12

•DISTRIBUTION THEORY
BINOMIALS
SELECTION AND RANKING PROCEDURES AND ORDER STATISTICS FOR THE BINOMIAL DISTRIBUTION.
AD-614 070 DIV. 15

PROBABILITY
THE LEBESGUE-STIELJES INTEGRAL AS APPLIED IN PROBABILITY DISTRIBUTION THEORY.
AD-614 256 DIV. 15

•DIURNAL VARIATIONS
ELECTRON DENSITY
REPRINT: DOWNWARD ELECTRON FLUX AT 1,000 KM ALTITUDE FROM ELECTRON CONTENT MEASUREMENT AT MID-LATITUDES.
AD-614 203 DIV. 2

•DOCUMENTATION
BIBLIOGRAPHIES
ANNOTATED BIBLIOGRAPHY OF RAND PUBLICATIONS IN COMPU TATIONAL LINGUISTICS.
AD-613 975 DIV. 32

LIBRARIES
REPRINT: U.S. GOVERNMENT SOURCES OF RESEARCH AND DEVELOP MENT INFORMATION.
AD-614 356 DIV. 32

SCIENTIFIC RESEARCH
TECHNICCAL PROGRESS ON FUNDAMENTAL AND APPLIED RESEARCH PROGRAMS.
AD-614 042 DIV. 30

•DOPPLER NAVIGATION
DOPPLER SYSTEMS
REPRINT: TRANSIT NAVIGA TIONAL SATELLITE SYSTEM.
AD-614 162 DIV. 19

•DOSIMETERS
RADIATION MEASUREMENT SYSTEMS
SOLID STATE NUCLEAR DETECTOR.
AD-614 432 DIV. 20

•DRAG
BODIES OF REVOLUTION
SKIN FRICTION DRAG AND SHEAR STRESS DISTRIBUTION ON SEVERAL STREAMLINED BODIES OF REVOLUTION WITH VARIED FINENESS RATIO.
AD-614 237 DIV. 9

SPHERES
EXPERIMENTS ON THE LIFT AND DRAG OF SPHERES SUSPENDED IN A LOW REYNOLDS NO. POISEUILLE FLOW.
AD-613 939 DIV. 9

•DYES
CRYSTAL GROWTH
TRANSLATION OF RUSSIAN RESEARCH: TYPE OF GROWTH AND PROPERTIES OF LIQUID CRYSTALS OF THIAZINE DYES.
AD-613 989 DIV. 25

•DYSPROSIUM
MANGANESE ALLOYS
COMPOUNDS DYMN2, HOMN2 AND ERMN2.

CALCULATION OF THE ENERGY AND FREE ENTHALPY OF FORMATION OF RE-MERCURYCOMPOUNDS BY VAPOUR PRESSURE MEASUREMENTS AND THERMAL ANALYSIS.
AD-619 463 DIV. 25

•EARTHQUAKES
SEISMOLOGY
REPRINT: A STUDY OF THE AFTERSHOCKS AND FOCAL MECHANISM OF THE SALINAS-WATSONVILLE EARTHQUAKES OF AUGUST 31 AND SEPTEMBER 14, 1963.
AD-619 339 DIV. 2

•ECONOMICS
COMMERCE
REVIEW OF THE THEORY OF CUSTOMS UNIONS.
AD-619 407 DIV. 32

MATHEMATICAL MODELS
THEORY OF GROWTH: REMODELLING AND REFINEMENTS.
AD-619 252 DIV. 32

•EDUCATION
APPLIED PSYCHOLOGY
REPRINT: SELF-EVALUATIONAL RESPONDING AND TYPOGRAPHICAL CUEING: TECHNIQUES FOR PROGRAMING SELF-INSTRUCTIONAL READING MATERIALS.
AD-619 316 DIV. 23

•ELASTIC SCATTERING
DIFFERENTIAL CROSS SECTION
DIFFERENTIAL CROSS SECTIONS FOR ELECTRONS ELASTICALLY SCATTERED BY HELIUM ATOMS.
AD-613 929 DIV. 20

NUCLEAR PARTICLES
REPRINT: A NOTE ON THE SIGNATURES OF THE DOMINANT REGGE TRAJECTORIES.
AD-619 537 DIV. 20

•ELASTICITY
SHEETS
LINEAR EQUATIONS OF ANISOTROPIC ELASTIC PLATES.
AD-619 132 DIV. 25

SINGLE CRYSTALS
REPRINT: ELASTIC CONSTANTS OF HGTE.
AD-619 308 DIV. 25

•ELASTOMERS
SYNTHESIS (CHEMISTRY)
QM ELASTOMER CONTRACT.
AD-613 945 DIV. 4
SYNTHESIS OF ELASTOMERS CONTAINING SI-N BONDS IN THE MAIN CHAIN.
AD-619 473 DIV. 4

•ELECTRIC CABLES
REELS
SHIPBOARD CABLE-HAULING SYSTEM FOR LARGE ELECTRICAL CABLES.
AD-619 071 DIV. 31

•ELECTRIC CURRENTS
DISTRIBUTION
REPRINT: CURRENT DISTRIBUTION IN A MAGNETIC ANNULAR SHOCK TUBE.
AD-619 212 DIV. 30

•ELECTRIC DISCHARGES
STATISTICAL ANALYSIS
INVESTIGATION OF THE STATISTICS OF BREAKDOWN USING NANOSECOND PULSE TECHNIQUES.
AD-619 286 DIV. 2

•ELECTRIC FIELDS
PARTICLE TRAJECTORIES
TRANSLATION OF RUSSIAN RESEARCH: SIMULATION OF PARTICLE MOTION IN INTERSECTING ELECTRIC AND MAGNETIC FIELDS.
AD-613 980 DIV. 25

•ELECTRIC FILTERS
VERY LOW FREQUENCY
ON THE DESIGN OF A RESISTANCE-CAPACITANCE FILTER FOR USE AT VERY LOW FREQUENCIES.
AD-613 947 DIV. 8

•ELECTRIC POWER PRODUCTION
FUEL CELLS
TRANSLATION OF EAST GERMAN ARTICLE DEVELOPMENT OF FUEL CELL ELECTRICAL ENERGY SOURCES.
AD-619 388 DIV. 7

•ELECTRICAL CABLES
ANTENNAS
ANTENNA WIRE SAG AND TENSION CALCULATIONS.
AD-619 079 DIV. 8

•ELECTRICAL ENGINEERING
PROGRAMMING (COMPUTERS)
COMPUTER ALGORITHM FOR FAULT ISOLATION AND TEST POINT SELECTION.
AD-613 960 DIV. 8

•ELECTRICAL NETWORKS
MATHEMATICAL LOGIC
REPRINT: A SYMBOLIC NOTATION APPLIED TO UNBALANCED LADDER NETWORKS.
AD-619 141 DIV. 8

MATRIX ALGEBRA
REPRINT: SINGULAR NETWORK ELEMENTS.
AD-613 919 DIV. 8

SENSITIVITY
REPRINT: THE SENSITIVITY OF A TRAFFIC NETWORK.
AD-619 560 DIV. 8

SYNTHESIS
REPRINT: A NOTE ON ACTIVE RC REALIZATION OF VOLTAGE TRANSFER FUNCTIONS.
AD-619 554 DIV. 8

•ELECTRICAL PROPERTIES
COBALT COMPOUNDS
REPRINT: MAGNETIC AND ELECTRICAL ANOMALIES IN LACOO3.
AD-619 216 DIV. 25

•ELECTROCHEMISTRY
PARAMAGNETIC RESONANCE
REPRINT: APPLICATION OF ELECTRON PARAMAGNETIC RESONANCE TECHNIQUES IN ELECTROCHEMISTRY.
AD-619 538 DIV. 4

SEMICONDUCTORS
REPRINT: ELECTROCHEMICAL DEMBER EFFECT IN SEMICONDUCTORS.
AD-619 180 DIV. 25

•ELECTRODES
CHEMICAL REACTIONS
OXIDES ON THE SILVER ELECTRODE. PART 2. X-RAY DIFFRACTION STUDIES OF THE WORKING SILVER ELECTRODE.
AD-619 058 DIV. 7

CORROSION
ELECTROCHEMICAL STUDIES IN THE SYNTHESIS OF N-F COMPOUNDS: ELECTRODE AND HF HANDLING EQUIPMENT DEVELOPMENT.
AD-619 098 DIV. 4

FUEL CELLS
REPRINT: FUEL CELL ELECTRODES FOR ACID MEDIA.
AD-619 329 DIV. 7

POLARIZATION
REPRINT: ELECTROCHEMICAL BEHAVIOR OF TIOX SOLID SOLUTIONS IN AQUEOUS HF AND HF-HCL MIXTURES.
AD-619 183 DIV. 4

ZINC
ZINC ELECTRODES FOR LONG LIFE, LIGHT WEIGHT SILVER OXIDEZINC SECONDARY BATTERIES.
AD-619 119 DIV. 7

•ELECTROLYTES
CARBONATES
EFFECT OF CARBONATED ELECTROLYTE ON THE PERFORMANCE OF SINTERED PLATE NICKEL-CADMIUM CELLS.
AD-619 104 DIV. 7

THERMODYNAMICS
REPRINT: THERMODYNAMIC PROPERTIES OF AQUEOUS SOLUTIONS OF MIXED ELECTROLYTES. THE HYDROCHLORIC ACID-POTASSIUM CHLORIDE SYSTEM FROM 40 TO 0C.
AD-619 555 DIV. 4

•ELECTROLYTES (PHYSIOLOGY)
HYPERTENSION
REPRINT: WATER AND ELECTROLYTE CONTENT OF NORMAL AND HYPERTENSIVE ARTERIES IN DOGS.
AD-619 561 DIV. 16

•ELECTROMAGNETIC FIELDS
DIURNAL VARIATIONS
RESULTS OF SIMULTANEOUS ELF MEASUREMENTS AT BRANNENBURG, GERMANY AND KINGSTON, R. I.
AD-619 012 DIV. 2

QUANTUM MECHANICS
THEORY OF COHERENCE FOR THE QUANTIZED ELECTROMAGNETIC FIELD.
AD-619 062 DIV. 25

•ELECTROMAGNETIC RADIATION
REVIEWS
VERY LOW FREQUENCY PROPAGATION; ELECTRON AND SOLID STATE PHYSICS; AUTOMATIC CONTROL; COMMUNICATIONS AND NETWORKS; ELECTROMAGNETIC RADIATION.
AD-619 130 DIV. 30

•ELECTROMAGNETIC WAVE REFLECTIONS
PHASE SHIFT
REPRINT: SIMPLE CONSTRUCTION FOR DETERMINING THE PHASE CHANGE OF LIGHT REFLECTED AT NORMAL INCIDENCE.
AD-619 309 DIV. 25

•ELECTROMAGNETIC WAVES
PROPAGATION
ANTENNA RADIATION IN A MOVING DISPERSIVE MEDIUM.
AD-619 279 DIV. 8
ELECTROMAGNETIC WAVE PROPAGATION IN ANISOTROPIC PLASMAS ALONG THE DIRECTION OF A STATIC MAGNETIC FIELD.
AD-619 442 DIV. 25

SCATTERING
DIFFRACTION AND SCATTERING BY REGULAR BODIES.
AD-619 046 DIV. 8

•ELECTRON BEAMS

BACKWARD-WAVE OSCILLATORS
GENERATION OF INFRAMILLIMETRIC WAVES BY MEANS OF ELECTRONIC BEAMS.
AD-614 124 DIV. 8

NUCLEAR SCATTERING
ELECTRON SCATTERING ON NUCLEONS, THREE-BODY NUCLEI, AND CA40.
AD-614 270 DIV. 20

PLASMA MEDIUM
REPRINT: GENERATION OF A HOT, DENSE PLASMA BY A COLLECTIVE BEAM-PLASMA INTERACTION.
AD-614 384 DIV. 25

•ELECTRON CAPTURE
SEMICONDUCTORS
REPRINT: HOT-ELECTRON LOSS VIA WIGGLED AUGER RECOMBINATION IN SEMICONDUCTORS.
AD-614 358 DIV. 25

•ELECTRON DENSITY
IONOSPHERE
REPRINT: DOWNWARD ELECTRON FLUX AT 1,000 KM ALTITUDE FROM ELECTRON CONTENT MEASUREMENT AT MID-LATITUDES.
AD-614 203 DIV. 2

•ELECTRON DIFFRACTION ANALYSIS
MOLECULAR STRUCTURE
REPRINT: AUTO-AND CROSS-CORRELATION FUNCTIONS USED AS TOOLS FOR INFORMATION RETRIEVAL IN ELECTRON DIFFRACTION STRUCTURE STUDIES.
AD-614 534 DIV. 25

•ELECTRON TRANSITIONS
ANTIMONY
REPRINT: OBSERVATION OF INTERBAND TRANSITIONS IN ANTIMONY.
AD-614 312 DIV. 25

LINE SPECTRUM
REPRINT: GUEST-HOST INTERACTIONS: AN EXAMINATION OF THE SOLVENT-INDUCED SPECTRAL SHIFT IN A MODEL SYSTEM.
AD-614 289 DIV. 25

•ELECTRON TUBES
MICROWAVE AMPLIFIERS
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-613 994 DIV. 8
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-613 995 DIV. 8
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-614 055 DIV. 8

WELDING
ULTRASONIC WELDING PROCESS AND EQUIPMENT FOR CONSTRUCTION OF ELECTRON-TUBE MOUNTS.
AD-614 450 DIV. 26

•ELECTRONIC EQUIPMENT
AIRBORNE
MICRO-NOTES. INFORMATION OF MICROELECTRONICS FOR NAVY AVIONICS EQUIPMENT.
AD-614 116 DIV. 8

•ELECTRONICS
SCIENTIFIC RESEARCH
TECHNICCAL PROGRESS ON FUNDAMENTAL AND APPLIED RESEARCH PROGRAMS.
AD-614 042 DIV. 30

•ELECTRONS
CRYSTALS
PROPERTIES OF CONDUCTION ELECTRONS IN IONIC CRYSTALS.
AD-614 091 DIV. 25

ELASTIC SCATTERING
DIFFERENTIAL CROSS SECTIONS FOR ELECTRONS ELASTICALLY SCATTERED BY HELIUM ATOMS.
AD-613 929 DIV. 20

MAGNETIC FIELDS
GROUND STATE OF AN ELECTRON GAS IN A MAGNETIC FIELD.
AD-614 254 DIV. 25

RELAXATION TIME
REPRINT: DETERMINATION OF ELECTRON RELAXATION TIME FROM THE GIANT QUANTUM OSCILLATIONS IN THE ACOUSTIC ABSORPTION OF METALS.
AD-614 527 DIV. 25

RESONANCE ABSORPTION
REPRINT: RESONANT ABSORPTION OF ULTRASOUND BY OPENORBIT ELECTRONS IN CADMIUM.
AD-614 372 DIV. 25

•ELECTROSTATIC FIELDS
JET PLANES
MEASUREMENT OF ELECTROSTATIC CHARGE ON AIRCRAFT.
AD-614 060 DIV. 1

•ELECTROSTATICS
PLASMA MEDIUM
ADIABATIC LINEAR STARK EFFECT IN A PLASMA.
AD-614 283 DIV. 25

•ELEMENTARY PARTICLES
RESONANCE
REPRINT: RESONANT FREQUENCY MIXING EFFECTS IN DISTRIBUTED MEDIA.
AD-614 208 DIV. 25

RESONANCE SCATTERING
REPRINT: SCATTERING MATRIX APPROACH TO THE LAMBDA HYPERON-PION RESONANCE.
AD-614 374 DIV. 20

•ELLIPSOIDS
STABILITY
REPRINT: ON THE STABILITY OF THE JACOBI ELLIPSOIDS.
AD-614 156 DIV. 2

•ENERGY CONVERSION
PLASMA PHYSICS
PLASMA KINETIC ENERGY -RF CONVERSION.
AD-614 285 DIV. 8

•ENTEROBACTERIACEAE
CULTURE MEDIA
REPRINT: FIELD TRIAL OF A NEW TRANSPORT MEDIUM FOR COLLECTION OF FECES FOR BACTERIOLOGIC EXAMINATION.
AD-614 191 DIV. 16

•ENZYMES
ESCHERICHIA COLI
REPRINT: RIBOSOMAL PEPTIDASE FROM ESCHERICHIA COLI B.
AD-614 521 DIV. 16

•EPIDEMIOLOGY
MILITARY PERSONNEL
REPRINT: RELATIONSHIP OF RHINOVIRUS INFECTION TO MILD UPPER RESPIRATORY DISEASE. II. EPIDEMIOLOGIC OBSERVATIONS IN MALE MILITARY TRAINEES.
AD-614 305 DIV. 16
REPRINT: PATTERNS OF ADENOVIRUS INFECTIONS IN MARINE CORPS PERSONNEL. I. A 42-MONTH SURVEY IN RECRUIT AND NONRECRUIT POPULATIONS. II. LONGITUDINAL STUDY OF SUCCESSIVE ADVANCED RECRUIT TRAINING COMPANIES.
AD-614 306 DIV. 16

•EPOXY PLASTICS
PHOTOELASTICITY
TRANSLATION OF JAPANESE RESEARCH: SOME NEW FREEZE PHOTOELASTIC MATERIALS AND THEIR APPLICATION.
AD-614 278 DIV. 14

•EQUATIONS OF STATE
EXPLOSIVES INITIATORS
EQUATIONS OF STATE IN SHOCK INITIATION PROBLEMS.
AD-613 989 DIV. 4

•ERBIUM
MANGANESE ALLOYS
COMPOUNDS DYMN2, HOMN2 AND ERMN2. CALCULATION OF THE ENERGY AND FREE ENTHALPY OF FORMATION OF RE-MERCURYCOMPOUNDS BY VAPOUR PRESSURE MEASUREMENTS AND THERMAL ANALYSIS.
AD-614 463 DIV. 25

•ERRORS
CODING
FACTORS AFFECTING CODING ERRORS.
AD-614 415 DIV. 8

PROBABILITY
QUANTIFICATION OF HUMAN RELIABILITY. A FEASIBILITY DEMONSTRATION.
AD-614 134 DIV. 28

•ERYTHROCYTES
AGING (PHYSIOLOGY)
REPRINT: RELATIONSHIP BETWEEN ACTIVITY OF PYRUVATE KINASE AND AGE OF THE NORMAL HUMAN ERYTHROCYTE.
AD-614 522 DIV. 16

AMINO ACIDS
REPRINT: SPECIFICITY OF AMINO ACID ENTRY ROUTES IN PIGEON ERYTHROCYTES.
AD-614 314 DIV. 16

•ESCHERICHIA COLI
ENZYMES
REPRINT: RIBOSOMAL PEPTIDASE FROM ESCHERICHIA COLI B.
AD-614 521 DIV. 16

MUSTARD AGENTS
ELIMINATION OF SULFUR MUSTARD-INDUCED ALKYLATION PRODUCTS FROM DNA OF ESCHERICHIA COLI.
AD-614 267 DIV. 16
UNBALANCED GROWTH AND LATENT KILLING OF ESCHERICHIA COLI FOLLOWING EXPOSURE TO SULFUR MUSTARD.
AD-614 284 DIV. 16

•ETHYLENE OXIDE
HYDROLYSIS
REPRINT: EFFECT OF PRESSURE ON THE HYDROLYSIS OF METHYL ACETATE AND ETHYLENE OXIDE IN ACETONE WATER MIXTURES: QUANTITIES OF ACTIVATION AT CONSTANT VOLUME, AND THE ISOKINETIC PRESSURE.
AD-614 516 DIV. 4

•EXCITATION
BAND SPECTRUM

REPRINT: EFFECT OF UNIAXIAL STRESS ON THE EXCITATION SPECTRA OF DONORS IN SILICON.
AD-619 529 DIV. 25

COLOR CENTERS
EXCITON ABSORPTION IN THE PRESENCE OF EXCITED F-CENTERS.
AD-619 487 DIV. 25

CYANOGEN
REPRINT: OPTICAL DETECTION OF MICROWAVE TRANSITIONS BETWEEN EXCITED ELECTRONIC STATES OF CN AND THE IDENTIFICATION OF THE TRANSITIONS INVOLVED.
AD-619 553 DIV. 25

DEUTERIUM
REPRINT: VIBRATIONAL EXCITATION IN SOME FOUR-CENTER TRANSITION STATES.
AD-619 548 DIV. 4

LASERS
REPRINT: HANLE EFFECT IN THE HE-NE LASER.
AD-619 360 DIV. 25

THULIUM
REPRINT: COULOMB EXCITATION OF TM169.
AD-619 209 DIV. 20

•EXPLOSIVES INITIATORS
SHOCK WAVES
EQUATIONS OF STATE IN SHOCK INITIATION PROBLEMS.
AD-613 989 DIV. 4

•EXTRATERRESTIAL RADIO WAVES
MONITORS
DIGITIZING RIOMETER SYSTEM.
AD-619 247 DIV. 30

•EXTRATERRESTRIAL TOPOGRAPHY
MOON
REPRINT: A MODEL OF THE LUNAR SURFACE.
AD-619 169 DIV. 2

•EYE
MEDICAL EXAMINATION
REPRINT: OPHTHALMOSCOPY OF PIGEONS USING TRANSILLUMINATION.
AD-619 194 DIV. 16

PATHOLOGY
REPRINT: OCULAR COMPLICATIONS OF STEROID THERAPY.
AD-619 186 DIV. 16

•FALLING BODIES
CHARGED PARTICLES
REPRINT: FALLING ELECTRICALLY CHARGED PARTICLES.
AD-619 166 DIV. 25

•FATIGUE (MECHANICS)
INTERNAL FRICTION
TRANSLATION OF RUSSIAN RESEARCH: MECHANICAL AND THERMAL FATIGUE OF METALS BY THE INTERNAL FRICTION METHOD.
AD-619 019 DIV. 17

•FEEDBACK
CONTROL SYSTEMS
REPRINT: STABILITY CRITERION FOR PULSE-WIDTH-MODULATED FEEDBACK CONTROL SYSTEMS.
AD-619 489 DIV. 30

•FERRITES
CRYSTAL STRUCTURE
DETERMINATION OF THE CRYSTAL STRUCTURE OF YTTRIUM ORTHOFERRITE AND REFINEMENT OF GADOLINIUM ORTHOFERRITE.
AD-619 495 DIV. 25

MAGNETIC MOMENTS
SATURATION PHENOMENA IN ZN2Y FERRITE AT FREQUENCIES BELOW RESONANCE.
AD-619 239 DIV. 25

MAGNETIC RESONANCE
STUDY OF PARALLEL PUMPING IN MICROWAVE FERRITES.
AD-619 049 DIV. 8

PHASE SHIFTERS
HELICAL PHASE SHIFTERS.
AD-619 069 DIV. 8

•FERROCENES
METALATION
REPRINT: RING METALATION OF DIMETHYLAMINOMETHYLFERROCENE WITH BUTYLLITHIUM AND CONDENSATIONS WITH ELECTROPHILIC COMPOUNDS. SYNTHESIS OF 1,2-DISUBSTITUTED FERROCENES.
AD-619 544 DIV. 4

•FERROELECTRIC CRYSTALS
COMPUTER LOGIC
APPLICATION OF FERRO- AND FERRIELECTRIC PHENOMENA IN COMPUTER DEVICES.
AD-619 010 DIV. 30

•FERROMAGNETIC MATERIALS
PUMPING (ELECTRONICS)
SATURATION PHENOMENA IN ZN2Y FERRITE AT FREQUENCIES BELOW RESONANCE.
AD-619 239 DIV. 25

TRANSITION TEMPERATURE
REPRINT: CURIE POINT MEASUREMENT AT HIGH PRESSURE BY A SINGLE COIL TECHNIQUE.
AD-619 322 DIV. 30

•FERROMAGNETISM
TRANSITION ELEMENTS
FERROMAGNETISM IN THE TRANSITION METALS.
AD-613 977 DIV. 25

•FIBER OPTICS
CATHODE RAY TUBES
< INCH DIAMETER CATHODE RAY TUBE WITH FIBER OPTIC FACE= PLATE.
AD-619 448 DIV. 8

•FIELD THEORY
CHARGED PARTICLES
REPRINT: FALLING ELECTRICALLY CHARGED PARTICLES.
AD-619 166 DIV. 25

PHOTONS
REPRINT: ON MASSIVE AND MASSLESS PHOTONS.
AD-619 184 DIV. 25

QUANTUM MECHANICS
THEORY OF COHERENCE FOR THE QUANTIZED ELECTROMAGNETIC FIELD.
AD-619 062 DIV. 25

•FILAMENT WOUND CONSTRUCTION
COMPOSITE MATERIALS
INTERLAMINAR SHEAR OF FILAMENT-WOUND REINFORCED PLASTICS.
AD-613 997 DIV. 14

•FILMS
GRAPHITE
FRICTION AND WEAR BEHAVIOR OF SOLID FILMS.
AD-619 242 DIV. 14

MICROSTRUCTURE
TRANSLATION OF RUSSIAN RESEARCH: VITRIFIED LIQUID CRYSTAL FILMS.
AD-613 986 DIV. 25

•FILTERS (ELECTROMAGNETIC WAVE)
DATA PROCESSING SYSTEMS
DIGITAL FILTERS FOR DATA PROCESSING.
AD-619 033 DIV. 30

•FINISHES AND FINISHINGS
SILANES
NEW ARYLOXY ALKOXY SILANES WHICH ARE POTENTIAL GLASS FIBER FINISHES.
AD-613 936 DIV. 14

•FISHES
HYDRODYNAMICS
REPRINT: THEORETICAL STUDIES OF SEA ANIMAL LOCOMOTION.
AD-619 140 DIV. 9

•FLIGHT
LOW ALTITUDE
EFFECTS OF TASK LOADING ON PILOT PERFORMANCE DURING SIMULATED LOW-ALTITUDE HIGH-SPEED FLIGHT.
AD-619 243 DIV. 28

•FLIGHT INSTRUMENTS
RECORDING SYSTEMS
FULL FLIGHT PERFORMANCE TESTING, PHYSICAL DATA AND TYPES OF INSTRUMENTS REQUIRED: METHODS OF CORRECTING AND RECORDING RESULTS ON STANDARD FORMS.
AD-613 955 DIV. 1

•FLIGHT TESTING
TEST METHODS
FULL FLIGHT PERFORMANCE TESTING, PHYSICAL DATA AND TYPES OF INSTRUMENTS REQUIRED: METHODS OF CORRECTING AND RECORDING RESULTS ON STANDARD FORMS.
AD-613 955 DIV. 1

•FLORIDA STRAIT
OCEANOLOGY
MARINE GEOLOGY AND OCEANOGRAPHY OF FLORIDA BAY, APALACHICOLA BAY AND VICINITY, FLORIDA.
AD-619 437 DIV. 2

•FLOW METERS
FLUID MECHANICS
TRANSLATION OF RUSSIAN RESEARCH: THERMOANEMOMETER WITH DC FEEDBACK.
AD-619 020 DIV. 30

•FLOW VISUALIZATION
INSTRUMENTATION
DEVICE FOR THE DIRECT MEASUREMENT OF UNSTEADY AIR FLOWS AND SOME CHARACTERISTICS OF BOUNDARY LAYER TRANSITION.
AD-619 008 DIV. 9

SPARK SHADOWGRAPH PHOTOGRAPHY
TRANSLATION OF RUSSIAN RESEARCH: USE OF SHADOWGRAPH MEASUREMENTS FOR QUALITATIVE RESEARCH OF A SUPERSONIC FLOW AROUND A WING PROFILE.
AD-619 389 DIV. 9

•FLUID FLOW
MATHEMATICAL ANALYSIS
SOME RECENT DEVELOPMENTS IN THE THEORY OF VISCOUS FLUID FLOW WITH TECHNOLOGICAL AND GEOPHYSICAL APPLICATIONS.
AD-619 429 DIV. 9

•FLUID MECHANICS
AERODYNAMIC CONFIGURATIONS
THE VELOCITY FIELD DOWNSTREAM

FROM A TWO-DIMENSIONAL MODEL HILL.
AD-619 067 DIV. 9

UNDERGROUND STRUCTURES
THE EFFECTS OF FLUID RESONANCE ON THE BOUNDARY STRESSES OF A FLUID-FILLED CAVITY.
AD-619 418 DIV. 13

•FLUORESCENCE
TEETH
REPRINT: CHARACTERISTICS OF INSOLUBLE PROTEIN OF TOOTH AND BONE 1. FLUORESCENCE OF SOME ACIDIC HYDROLYTIC FRAGMENTS.
AD-619 211 DIV. 16

•FLUORINATION
ELECTROCHEMISTRY
ELECTROCHEMICAL STUDIES IN THE SYNTHESIS OF N-F COMPOUNDS: ELECTRODE AND HF HANDLING EQUIPMENT DEVELOPMENT.
AD-619 098 DIV. 4

•FOILS
COMMUNICATION SATELLITES (PASSIVE)
REPRINT: LONG RANGE COMMUNICATION BY ORBITING DIPOLE BELTS.
AD-619 214 DIV. 5

•FOREST FIRES
NUCLEAR WARFARE
PROBABILITY OF EFFECTIVE POST-ATTACK FIRE FIGHTING IN WILDLANDS.
AD-619 488 DIV. 13

•FORMALDEHYDE
SPECTRA (INFRARED)
REPRINT: ANHARMONICITY CORRECTION FOR POLYATOMIC MOLECULES. METHODS AND APPLICATION TO FORMALDEHYDE.
AD-619 177 DIV. 25

•FREE RADICALS
BORON COMPOUNDS
REPRINT: ARYL BORON FREE RADICALS.
AD-619 547 DIV. 4

IDENTIFICATION
REPRINT: IDENTIFICATION OF FREE RADICALS IN FLASH PHOTOLYSIS.
AD-619 497 DIV. 25

IONIZATION POTENTIAL
REPRINT: EFFECT OF SUBSTITUTION ON THE IONIZATION POTENTIALS OF FREE RADICALS AND MOLECULES. THEORETICAL RATIONALIZATION FOR DIFFERING CORRELATIONS FOUND FOR BOND DISSOCIATION ENERGIES WITH IONIZATION POTENTIALS AND ELECTRON AFFINITIES OF ORGANIC OR INORGANIC RADICALS.
AD-619 922 DIV. 4

MASS SPECTROSCOPY
REPRINT: FREE RADICALS BY MASS SPECTROSCOPY: THERMAL DECOMPOSITION OF CYCLOPENTYL RADICALS.
AD-619 508 DIV. 4

NITROBENZENES
REPRINT: CORRELATION OF SOLVENT EFFECTS OF ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF THE NITROBENZENE ANION RADICAL.
AD-619 924 DIV. 4

PARAMAGNETIC RESONANCE
REPRINT: VOLTAMMETRY AND ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF HALONITRO BENZENE ANION RADICALS.
AD-619 291 DIV. 4

POLYMERIZATION
STATIONARY STATE CRITERION FOR FREE RADICAL POLYMERIZATION FOR LINEARLY INCREASING REACTION TEMPERATURE.
AD-619 077 DIV. 4

•FREQUENCY
BOUNDARY LAYER
REPRINT: INFLUENCE OF BOUNDARY CONDITIONS ON THE MODAL CHARACTERISTICS OF THIN CYLINDRICAL SHELLS.
AD-619 371 DIV. 25

STANDARDS
MICROELECTRONIC FREQUENCY AND TIME STANDARD.
AD-619 999 DIV. 8

•FREQUENCY CONVERTERS
NONLINEAR SYSTEMS
THEORY AND DESIGN OF FREQUENCY CONVERTERS USING COMBINATIONS OF PARAMETRIC ELEMENTS.
AD-619 122 DIV. 8

•FREQUENCY DIVIDERS
SIGNALS
SIGNAL DISTORTION IN A FREQUENCY DIVIDER.
AD-619 425 DIV. 8

•FREQUENCY MULTIPLIERS
X BAND
MICROWAVE SOLID-STATE GENERATORS.
AD-619 047 DIV. 8

•FUEL CELLS
ELECTRIC POWER PRODUCTION
TRANSLATION OF EAST GERMAN ARTICLE DEVELOPMENT OF FUEL CELL ELECTRICAL ENERGY SOURCES.
AD-619 288 DIV. 7

ELECTRODES
REPRINT: FUEL CELL ELECTRODES FOR ACID MEDIA.
AD-619 329 DIV. 7

•FUEL CONTAMINATION
BIBLIOGRAPHIES
COMPREHENSIVE BIBLIOGRAPHY FOR MECHANISM OF MICROBIOLOGICAL CONTAMINATION OF JET FUEL AND DEVELOPMENT OF TECHNIQUES FOR DETECTION OF MICROBIOLOGICAL CONTAMINATION. APPENDIX C.
AD-619 133 DIV. 10

•G AGENTS
CHEMICAL REACTIONS
REPRINT: REACTIONS OF ISOPROPYL METHYLPHOSPHONOFLUORIDATE WITH SUBSTITUTED PHENOLS.
AD-619 304 DIV. 4

•GADOLINIUM
ATOMIC STRUCTURE
REPRINT: BAND STRUCTURE AND MAGNETISM OF GADOLINIUM METAL.
AD-619 557 DIV. 25

MANGANESE ALLOYS
INVESTIGATIONS OF THE SYSTEMS Y-MN, GD-MN AND SM-MN.
AD-619 462 DIV. 17

•GADOLINIUM COMPOUNDS
FERRITES
DETERMINATION OF THE CRYSTAL STRUCTURE OF YTTRIUM ORTHOFERRITE AND REFINEMENT OF GADOLINIUM ORTHOFERRITE.
AD-619 495 DIV. 25

•GAME THEORY
STOCHASTIC PROCESSES
ON RANDOM WALKS WITH AN ABSORBING BARRIER AND GAMBLING SYSTEMS.
AD-619 069 DIV. 15

•GAMMA-PROTON REACTIONS
OXYGEN
REPRINT: THE EFFECT OF THE 3.10 MEV STATE OF F17 ON THE O16 (P, GAMMA) REACTION.
AD-619 209 DIV. 20

•GAS ANALYSIS
CARBON DIOXIDE
DEVELOPMENT OF A CARBON DIOXIDE PARTIAL PRESSURE SENSOR.
AD-619 226 DIV. 16

•GAS FLOW
FLOWMETERS
DEVICE FOR THE DIRECT MEASUREMENT OF UNSTEADY AIR FLOWS AND SOME CHARACTERISTICS OF BOUNDARY LAYER TRANSITION.
AD-619 008 DIV. 9

THRUST VECTOR CONTROL SYSTEMS
EXPERIMENTAL INVESTIGATION OF THE FLOW PHENOMENA INVOLVED IN GASEOUS THRUST DIRECTION CONTROL DEVICES.
AD-619 279 DIV. 27

•GASES
OSCILLATION
REPRINT: NON-RADIAL OSCILLATIONS OF GASEOUS MASSES.
AD-619 330 DIV. 2

PHYSICAL PROPERTIES
HANDBOOK OF SUPERSONIC AERODYNAMICS: PROPERTIES OF GASES.
AD-619 972 DIV. 9

•GASTROINTESTINAL SYSTEM
IODIDES
REPRINT: INFLUENCE OF THE GASTROINTESTINAL IODIDE CYCLE ON THE EARLY DISTRIBUTION OF RADIOACTIVE IODIDE IN MAN.
AD-619 189 DIV. 16

•GEOGRAPHY
MEXICO
TRINCHERAS AND PHYSICAL ENVIRONMENT ALONG THE RIO GAVILAN, CHIHUAHUA, MEXICO.
AD-619 441 DIV. 2

•GEOPHYSICS
TERRESTRIAL MAGNETISM
WORLD MAGNETIC SURVEY AND THE EARTH'S INTERIOR.
AD-619 409 DIV. 2

•GERMANIUM
ABSORPTION SPECTRUM
REPRINT: THE EFFECT OF STRAIN ON THE EXCITON SPECTRUM OF GERMANIUM.
AD-619 200 DIV. 25

INFRARED DETECTORS
PROCESS SPECIFICATIONS AND TEST PROCEDURES: ADDENDUM TO PEM FOR GOLD-DOPED GERMANIUM INFRARED DETECTOR TYPE IR400.
AD-619 013 DIV. 6

•GERMANIUM ALLOYS
ATOMIC ENERGY LEVELS

ELECTRONIC STRUCTURE
OF DILUTE SOLID SOLUTION ALLOYS
OF 3DTRANSITION METALS IN
A NON-MAGNETIC MATRIX.
AD-614 482 DIV. 25

•GLASS
NEODYMIUM COMPOUNDS
NEODYMIUM LASER GLASS
IMPROVEMENT PROGRAM.
AD-613 963 DIV. 25

•GLASS TEXTILES
FINISHES AND FINISHING
NEW ARYLOXY ALKOXY SILANES
WHICH ARE POTENTIAL GLASS
FIBER FINISHES.
AD-613 936 DIV. 14

•GLOBAL COMMUNICATION SYSTEMS
COMMUNICATION SATELLITES (PASSIVE)
REPRINT: LONG RANGE
COMMUNICATION BY ORBITING
DIPOLE BELTS.
AD-614 214 DIV. 5

•GLYCOSIDES
BIOSYNTHESIS
REPRINT: BIOSYNTHESIS
OF MUSTARD OIL GLUCOSIDES:
V. FORMATION OF GLUCONASTURTIIN
FROM L-GAMMA-PHENYLBUTYRINE
C(14)-N(15) IN WATERCRESS.
AD-614 508 DIV. 16
REPRINT: BIOSYNTHESIS
OF MUSTARD OIL GLUCOSIDES.
VI. BIOSYNTHESIS OF GLUCOBARBARIN
IN RESEDA LUTEOLA L.
AD-614 512 DIV. 16

•GOVERNMENT PROCUREMENT
LAW
REPORT OF THE ATTORNEY
GENERAL, PURSUANT TO SECTION
10(C) OF THE SMALL BUSINESS
ACT OF 1958 AS AMENDED.
AD-614 474 DIV. 18

•GRAPHICS
COLORS
FOUR-COLOR REDUCIBILITY
OF PLANAR GRAPHS CONTAINING
SUBGRAPHS WITH FOUR-POINT
BOUNDARIES.
AD-614 412 DIV. 15

•GRAPHITE
LUBRICATION
FRICTION AND WEAR BEHAVIOR
OF SOLID FILMS.
AD-614 242 DIV. 14

NUCLEAR MAGNETIC RESONANCE
REPRINT: ESR MEASUREMENT
OF SPIN SUSCEPTIBILITY OF
GRAPHITE IN A LOW MAGNETIC
FIELD.
AD-614 366 DIV. 20

•GRAVITY
PERTURBATION THEORY
GRAVITY DISTURBANCE COMPONENTS
FROM A SPHERICAL HARMONIC
EXPANSION OF THE DISTURBING
POTENTIAL.
AD-613 956 DIV. 2

THEORY
REPRINT: ON THE SCALAR
THEORY OF GRAVITATION.
AD-614 351 DIV. 25

•GROUP DYNAMICS
BEHAVIOR
SOME DETERMINANTS OF
SMALL-GROUP EFFECTIVENESS.
AD-613 954 DIV. 28

PERFORMANCE (HUMAN)
GROUP SUCCESS AND THE
PRODUCTION OF STATUS INCONGRUENCE
IN TASK-ORIENTED GROUPS.
AD-614 449 DIV. 28

•GROUPS (MATHEMATICS)
OPERATORS (MATHEMATICS)
DERIVATIONS OF OPERATOR
GROUP ALGEBRAS.
AD-613 927 DIV. 15

•GUIDED MISSILE LAUNCHERS
SERVOMECHANISMS
THE ANALYSIS OF ROUND-
OFF AND TRUNCATION ERRORS
OF THE CONTROLLER IN A HYBRID
(DIGITAL-ANALOG) CONTROL
SYSTEM.
AD-614 281 DIV. 30

•HALOCARBON PLASTICS
SYNTHESIS (CHEMISTRY)
QM ELASTOMER CONTRACT.
AD-613 948 DIV. 4

•HALOGEN COMPOUNDS
NITROBENZENES
REPRINT: VOLTAMMETRY
AND ELECTRON PARAMAGNETIC
RESONANCE SPECTRA OF HALONITRO
BENZENE ANION RADICALS.
AD-614 291 DIV. 4

•HEART
OBSTRUCTION (PHYSIOLOGY)
REPRINT: METABOLIC
RESPONSES DURING MYOCARDIAL
REACTIVE HYPEREMIA IN THE
UNANESTHETIZED DOG.
AD-614 346 DIV. 16
REPRINT: MYOCARDIAL
REACTIVE HYPEREMIA IN THE
UNANESTHETIZED DOG.
AD-614 347 DIV. 16

•HEAT OF SOLUTION
ELECTROLYTES
REPRINT: THERMODYNAMIC
PROPERTIES OF AQUEOUS SOLUTIONS
OF MIXED ELECTROLYTES. THE
HYDROCHLORIC ACID-POTASSIUM
CHLORIDE SYSTEM FROM 40 TO
60C.
AD-614 559 DIV. 4

•HEAT TRANSFER
ROCKET NOZZLES
EFFECT OF AN INTENSE
MAGNETIC FIELD ON ROCKET NOZZLE
HEAT TRANSFER. PART I:
THEORY AND SUPERCONDUCTING
MAGNET EXPERIMENTS.
AD-613 992 DIV. 27

SHOCK WAVES
REPRINT: END-WALL
HEAT-TRANSFER EFFECTS ON THE
TRAJECTORY OF A REFLECTED
SHOCK WAVE.
AD-614 378 DIV. 25

TEST REACTORS
THERMAL RESPONSE OF AER
OSPACE SHIELD TEST REACTOR
TO LOSS OF COOLANT.
AD-614 452 DIV. 20

•HEAT TREATMENT
STEEL
HOMOGENIZATION OF HIGH-
STRENGTH STEEL AT 2500 F.
AD-614 277 DIV. 26

•HELIUM
CRYSTAL LATTICES
REPRINT: GUEST-HOST
INTERACTIONS: AN EXAMINATION
OF THE SOLVENT-INDUCED SPECTRAL
SHIFT IN A MODEL SYSTEM.
AD-614 289 DIV. 25

DENSITY
REPRINT: DENSITY OF
LIQUID HELIUM-3 BETWEEN 0.04S
AND 1.3K.
AD-614 376 DIV. 4

IONIZATION
REPRINT: PHOTOIONIZATION
CROSS SECTION OF HELIUM IN
THE 100-TO 250-A REGION.
AD-614 533 DIV. 25

LASERS
REPRINT: HANLE EFFECT
IN THE HE-NE LASER.
AD-614 360 DIV. 25

MOLECULAR BEAMS
REPRINT: BEAMS OF
HELIUM ATOMS AT TEMPERATURES
BELOW 0.5 K.
AD-614 373 DIV. 25

PHOTONUCLEAR REACTIONS
REPRINT: RADIATIVE
CAPTURE OF HE3 BY LI7.
AD-614 515 DIV. 20

•HIGH-SPEED PHOTOGRAPHY
ILLUMINATION
TRANSLATION OF REPORT
ON RUSSIAN RESEARCH FOR
HIGH-SPEED COLOR PHOTOGRAPHY
OF SELF-ILLUMINATING PROCESSES.
AD-614 398 DIV. 24

•HOISTS
SHIPBORNE
SHIPBOARD CABLE-HAULING
SYSTEM FOR LARGE ELECTRICAL
CABLES.
AD-614 071 DIV. 31

•HOLMIUM
MANGANESE ALLOYS
COMPOUNDS DYMN2,
HOMN2 AND ERMN2.
CALCULATION OF THE ENERGY
AND FREE ENTHALPY OF FORMATION
OF RE-MERCURYCOMPOUNDS BY
VAPOUR PRESSURE MEASUREMENTS
AND THERMAL ANALYSIS.
AD-614 463 DIV. 25

•HYDRAULIC SYSTEMS
SERVOMECHANISMS
REPRINT: ANALYSIS
OF A LOADED HIGH-PRESSURE
HYDRAULIC ONOFF SERVOMECHANISM.
AD-614 535 DIV. 26

•HYDRAZINE DERIVATIVES
FLUORINATION
ELECTROCHEMICAL STUDIES
IN THE SYNTHESIS OF N-F
COMPOUNDS: ELECTRODE AND
HF HANDLING EQUIPMENT DEVELOP
MENT.
AD-614 098 DIV. 4

MOLECULAR ISOMERISM
REPRINT: REARRANGEMENT
OF 1,2-BIS(TRIMETHYLSILYL)
HYDRAZINE.
AD-614 290 DIV. 4

•HYDROCARBONS
INTERSTELLAR MATTER
REPRINT: LABORATORY
INVESTIGATIONS OF THE INTERSTELLAR
RADIO-FREQUENCY LINES OF CH
AND OTHER MOLECULES.
AD-614 518 DIV. 4

OXYGEN
REPRINT: COLLISIONAL
DEACTIVATION OF THE EXCITED
SINGLET OXYGEN ATOMS AND THEIR
INSERTION INTO THE CH BONDS
OF PROPANE.
AD-614 502 DIV. 4

PHOSPHORESCENCE
REPRINT: TEMPERATURE
DEPENDENCE OF THE LIFETIME
OF PHOSPHORESCENCE OF SOME

POLYNUCLEAR HYDROCARBONS IN VISCOUS SOLUTIONS.
AD-614 530 DIV. 4

•HYDROCHLORIC ACID
THERMODYNAMICS
REPRINT: THERMODYNAMIC PROPERTIES OF AQUEOUS SOLUTIONS OF MIXED ELECTROLYTES. THE HYDROCHLORIC ACID-POTASSIUM CHLORIDE SYSTEM FROM 40 TO 0C.
AD-614 555 DIV. 4

•HYDRODYNAMICS
FISHES
REPRINT: THEORETICAL STUDIES OF SEA ANIMAL LOCOMOTION.
AD-614 140 DIV. 9

GREEN'S FUNCTION
GREEN'S FUNCTIONS AND SUPERFLUID HYDRODYNAMICS.
AD-614 044 DIV. 25

•HYDROFOIL BOATS
VIBRATION
STRUCTURAL AND MACHINERY VIBRATIONS OF HYDROFOIL SHIPS.
AD-614 028 DIV. 31

•HYDROGEN
ADSORPTION
BASIC STUDY OF GAS-SOLID INTERACTIONS: I. INTERACTION OF HYDROGEN WITH PLATINIZED CARBON.
AD-614 041 DIV. 4

DEUTERIUM
REPRINT: VIBRATIONAL EXCITATION IN SOME FOUR-CENTER TRANSITION STATES.
AD-614 548 DIV. 4

ELECTRON TRANSITIONS
REPRINT: GUEST-HOST INTERACTIONS: AN EXAMINATION OF THE SOLVENT-INDUCED SPECTRAL SHIFT IN A MODEL SYSTEM.
AD-614 289 DIV. 25

MOLECULAR PROPERTIES
COLD-NEUTRON SCATTERING CROSS SECTION OF LIQUID HYDROGEN BASED ON A CONSISTENT-VIBRATIONS LIQUID MODEL.
AD-614 038 DIV. 25
CONSISTENT-VIBRATIONS MODEL OF THE INTERNAL DYNAMICS OF LIQUID HYDROGEN.
AD-614 039 DIV. 25

•HYDROGEN COMPOUNDS
BROMIDES
REPRINT: PHOTOCHEMICAL ADDITION OF HYDROGEN BROMIDE TO 2-BUTENE IN THE GAS PHASE.
AD-614 500 DIV. 4

CYANIDES
QUANTUM AND SOLID STATE ELECTRONICS.
AD-614 007 DIV. 25

•HYDROLYSIS
PRESSURE
REPRINT: EFFECT OF PRESSURE ON THE HYDROLYSIS OF METHYL ACETATE AND ETHYLENE OXIDE IN ACETONE WATER MIXTURES: QUANTITIES OF ACTIVATION AT CONSTANT VOLUME, AND THE ISOKINETIC PRESSURE.
AD-614 516 DIV. 4

•HYPERONS
DYNAMICS
REPRINT: DYNAMIC MODEL OF THE 1539-MEV XI• HYPERON.
AD-614 176 DIV. 20

•HYPERSONIC FLOW
CONICAL BODIES
A CONICAL THIN-SHOCK-LAYER THEORY UNIFORMLY VALID IN THE ENTROPY LAYER.
AD-614 444 DIV. 9

STAGNATION POINT
HYPERSONIC VISCOUS FLOW NEAR THE STAGNATION STREAMLINE OF A BLUNT BODY. A TEST OF LOCAL SIMILARITY.
AD-613 915 DIV. 9
HYPERSONIC VISCOUS FLOW NEAR THE STAGNATION STREAMLINE OF A BLUNT BODY. THIRD-ORDER BOUNDARY-LAYER THEORY AND COMPARISON WITH OTHER METHODS.
AD-613 916 DIV. 9

•HYPERTENSION
ELECTROLYTES (PHYSIOLOGY)
REPRINT: WATER AND ELECTROLYTE CONTENT OF NORMAL AND HYPERTENSIVE ARTERIES IN DOGS.
AD-614 561 DIV. 16

•ICE
DISPOSAL
SURVEY OF SNOW AND ICE REMOVAL TECHNIQUES.
AD-614 431 DIV. 33

SEAS
COMPUTER PROGRAM FOR FORECASTING THE WIND DRIFT OF SEA ICE.
AD-614 255 DIV. 2

•IMMUNITY
BACILLUS ANTHRACIS
REPRINT: STUDIES ON ANTHRAX INFECTIONS IN IMMUNIZED GUINEA PIGS.
AD-614 321 DIV. 16

•IMPURITIES
BERYLLIUM
BERYLLIUM RESEARCH AND DEVELOPMENT PROGRAM. VOLUME VI. INFLUENCE OF THE DISTRIBUTION OF OXIDE AND THE TOTAL IMPURITY LEVEL ON RECRYSTALLIZATION AND GRAIN GROWTH OF BERYLLIUM.
AD-613 952 DIV. 17

•INCOMPRESSIBLE FLOW
CONICAL BODIES
REPRINT: THE VISCOUS INCOMPRESSIBLE FLOW INSIDE A CONE.
AD-614 492 DIV. 9

•INDEXES
AIR FORCE RESEARCH
OAR CUMULATIVE INDEX OF RESEARCH RESULTS, 1964.
AD-614 096 DIV. 30

DOCUMENTATION
SCIENCE-TECHNOLOGY SUBJECT-HEADING LISTS IN ENGLISH, RECENT OR STILL USEFUL IN PROGRAMMING INFORMATION RETRIEVAL SYSTEMS.
AD-614 438 DIV. 32

RADIATION DAMAGE
RADIATION EFFECTS INFORMATION CENTER, MONTHLY ACCESSION LIST. COORDINATE INDEX, PART II, FOR ACCESSION LISTS FROM OCTOBER 1, 1964 TO MARCH 31, 1965.
AD-614 406 DIV. 32

•INELASTIC SCATTERING
NEUTRON SCATTERING
INTERACTIONS OF 14.6-MEV NEUTRONS IN IRON, LITHIUM-7, AND CARBON.
AD-614 451 DIV. 20

•INEQUALITIES
MEASURE THEORY
REPRINT: EQUIVALENCE OF CERTAIN INEQUALITIES COMPLEMENTING THOSE OF CAUCHY-SCHWARZ AND HOLDER.
AD-614 158 DIV. 15

•INFLUENZA VIRUS
ANTIGENS AND ANTIBODIES
REPRINT: EXTENT OF ANTIGENIC VARIATION OF A2 INFLUENZA VIRUSES FROM PROTOTYPE STRAINS.
AD-614 345 DIV. 16

•INFORMATION RETRIEVAL
SUBJECT INDEXING
SCIENCE-TECHNOLOGY SUBJECT-HEADING LISTS IN ENGLISH, RECENT OR STILL USEFUL IN PROGRAMMING INFORMATION RETRIEVAL SYSTEMS.
AD-614 438 DIV. 32

TEST METHODS
METHODOLOGY FOR TEST AND EVALUATION OF INFORMATION RETRIEVAL SYSTEMS.
AD-614 005 DIV. 32

•INFRARED DETECTORS
MANUFACTURING METHODS
PROCESS SPECIFICATIONS AND TEST PROCEDURES: ADDENDUM TO PEM FOR GOLD-DOPED GERMANIUM INFRARED DETECTOR TYPE IR400.
AD-614 013 DIV. 6

•INFRARED PHOTOGRAPHY
MOON
TRANSLATION OF RUSSIAN RESEARCH: EXPERIMENTS IN TELEVISION PHOTOGRAPHY OF THE MOON IN THE 0.8-1.1 AND 0.8-2.3 MICRON RANGE.
AD-614 399 DIV. 2

•INFRARED SPECTROSCOPY
CHEMISTRY
REPRINT: INFRARED SPECTROSCOPY... WHERE DO WE GO FROM HERE.
AD-614 504 DIV. 25

LINE SPECTRUM
RESEARCH ON MEASUREMENT OF PRESSURE INDUCED SHIFTS OF ABSORPTION LINES IN THE INFRARED SPECTRUM.
AD-614 234 DIV. 25

REVIEWS
RESEARCH ON BASIC FAR-INFRARED TECHNIQUES.
AD-613 966 DIV. 30

STARS
REPRINT: INFRARED PHOTOMETRY OF M-DWARF STARS.
AD-614 354 DIV. 2

•INORGANIC COMPOUNDS
METABOLISM
ON THE ASSIMILATION OF ENERGY FROM INORGANIC SOURCES IN AUTOTROPHIC FORMS OF LIFE.
AD-614 299 DIV. 16

•INSECTICIDES
CHEMICAL ANALYSIS
TRANSLATION OF RUSSIAN RESEARCH: APPROXIMATE ENZYMIC METHOD OF MICROANALYSIS FOR IDENTIFYING RESIDUAL AMOUNTS OF ORGANOPHOSPHORUS INSECTICIDES.
AD-614 396 DIV. 4

•INSTRUCTION MANUALS

PRINTING
A GUIDE TO THE TYPING OF MATHEMATICAL NOTATION.
AD-613 992 DIV. 24

•INTEGRAL EQUATIONS
MESON SCATTERING
NATURE OF THE RESONANCE IN THE STATIC PION-NUCLEON SCATTERING IN ONE-MESON APPROX IMATION.
AD-613 934 DIV. 20

TRANSPORT PROPERTIES
INVARIANT IMBEDDING AND REFORMULATION OF THE INTERNAL INTENSITY PROBLEM IN TRANSPORT THEORY.
AD-614 031 DIV. 25

•INTEGRAL TRANSFORMS
NONLINEAR SYSTEMS
SUPERPOSITION IN A CLASS OF NONLINEAR SYSTEMS.
AD-614 983 DIV. 15

•INTEGRALS
FLUID MECHANICS
CLASS OF MULTIPLE INTEGRALS OF THE STATIONARY PHASE TYPE OCCURRING IN THE THEORY OF WATER WAVES.
AD-613 973 DIV. 9

N-BODY PROBLEM
REPRINT: THREE-PARTICLE UNITARITY INTEGRAL.
AD-614 173 DIV. 25

PROBABILITY
THE LEBESGUE-STIELJES INTEGRAL AS APPLIED IN PROBABILITY DISTRIBUTION THEORY.
AD-614 256 DIV. 15

SPIN
REPRINT: CALCULATION OF SPIN-SPIN INTERACTION INTEGRALS.
AD-614 379 DIV. 25

•INTEGRATED CIRCUITS
DESIGN
SMALL SIGNAL SEMICONDUCTOR COMPOSITS: INTEGRATED IF AMPLIFIER, LIMITER, SQUELCH, AND AUDIO CIRCUITS FOR MANPACK RADIO EQUIPMENT.
AD-614 090 DIV. 8

RELIABILITY (ELECTRONICS)
RELIABILITY OF INTEGRATED CIRCUITS USED IN MISSILE SYSTEMS.
AD-614 103 DIV. 8

TRANSISTORS
INTEGRATED SILICON DEVICE TECHNOLOGY. VOLUME VI. UNIPOLAR TRANSISTORS.
AD-613 951 DIV. 8

•INTEGRATORS
PROGRAMMING (COMPUTERS)
TRANSLATION OF RUSSIAN PATENT ON SELF-ADJUSTING SYSTEM FOR PROGRAMMED CONTROL OF METAL-CUTTING MACHINE TOOLS.
AD-614 022 DIV. 30

•INTERFEROMETERS
ASTRONOMICAL DATA
RELATIVE ADVANTAGES OF INTERFEROMETER OVER TELESCOPE FOR MEASURING SOURCE SIZES.
AD-614 248 DIV. 30

ASTRONOMICAL OBSERVATORIES
REPRINT: THE STELLAR INTERFEROMETER AT NARRABRI.
AD-614 936 DIV. 2

RESONATORS
FABRY-PEROT RESONANCES AT SMALL FRESNEL NUMBERS.
AD-614 063 DIV. 25

•INTERMETALLIC COMPOUNDS
RARE EARTH ELEMENTS
X-RAY-, DTA-, AND THERM OMAGNETIC ANALYSIS OF MANGANESE INTERMETALLIC COMPOUNDS.
AD-614 466 DIV. 17

SUBLIMATION
REPRINT: PARTIAL PRESSURES AND GIBBS FREE ENERGY OF FORMATION FOR CONGRUENTLY SUBLIMING CDTE(C).
AD-614 292 DIV. 25

•INTERNAL FRICTION
METALS
TRANSLATION OF RUSSIAN RESEARCH: MECHANICAL AND THERMAL FATIGUE OF METALS BY THE INTERNAL FRICTION METHOD.
AD-614 019 DIV. 17

•INTERSTELLAR MATTER
RADIOFREQUENCY SPECTROSCOPY
REPRINT: LABORATORY INVESTIGATIONS OF THE INTERSTELLAR RADIO-FREQUENCY LINES OF CH AND OTHER MOLECULES.
AD-614 518 DIV. 4

•IODIDES
ABSORPTION (BIOLOGICAL)
REPRINT: INFLUENCE OF THE GASTROINTESTINAL IODIDE CYCLE ON THE EARLY DISTRIBUTION OF RADIOACTIVE IODIDE IN MAN.
AD-614 185 DIV. 16

•ION ENGINES
PARTICLE BEAMS
PARTICLE GROWTH IN THE IONIC NUCLEATION CONDENSATION COLLOIDAL ION SOURCE.
AD-614 111 DIV. 27

•ION SOURCES
COLLOIDS
PARTICLE GROWTH IN THE IONIC NUCLEATION CONDENSATION COLLOIDAL ION SOURCE.
AD-614 111 DIV. 27

•IONIZATION
PROBABILITY
REPRINT: PHOTOIONIZATION CROSS SECTION OF HELIUM IN THE 100-TO 250-A REGION.
AD-614 533 DIV. 25

•IONIZATION POTENTIALS
FREE RADICALS
REPRINT: EFFECT OF SUBSTITUTION ON THE IONIZATION POTENTIALS OF FREE RADICALS AND MOLECULES. THEORETICAL RATIONALIZATION FOR DIFFERING CORRELATIONS FOUND FOR BOND DISSOCIATION ENERGIES WITH IONIZATION POTENTIALS AND ELECTRON AFFINITIES OF ORGANIC OR INORGANIC RADICALS.
AD-613 922 DIV. 4

•IONOSPHERE
DIURNAL VARIATIONS
REPRINT: CAUSE OF THE MID-LATITUDE EVENING ELECTRON DENSITY IN THE F SUB 0 F SUB 2 LAYERS OF THE IONOSPHERE.
AD-614 310 DIV. 2

PHYSICAL PROPERTIES
TRANSLATION OF RUSSIAN RESEARCH: IRREGULARITY STRUCTURE AND MOVEMENT IN THE IONOSPHERE.
AD-613 982 DIV. 2

RECOMBINATION REACTIONS
REPRINT: ELECTRON-ION RECOMBINATION IN NITROGEN.
AD-614 160 DIV. 2

•IRON
IMPURITIES
GRAIN BOUNDARY SEGREGATION AND THE COLD WORK PEAK IN IRON CONTAINING CARBON OR NITROGEN.
AD-613 970 DIV. 17

•IRON ALLOYS
NICKEL ALLOYS
ROLE OF CARBON AND FINE STRUCTURE IN THE HARDENING OF IRON-NICKEL-CARBON MARTENSITES.
AD-614 447 DIV. 17

RUTHENIUM ALLOYS
THERMODYNAMICS OF MARTENSITIC F. C. C. REVERSIBLY YIELDS B. C. C. AND F. C. C. REVERSIBLY YIELDS H. C. P. TRANSFORMA TIONS IN THE IRON-RUTHENIUM SYSTEM.
AD-614 009 DIV. 17

STABILITY
DIMENSIONAL STABILITY OF SELECTED ALLOY SYSTEMS.
AD-613 931 DIV. 17

•IRRADIATED FOODS
ARTIFICIAL RADIOACTIVITY
INDUCED RADIOACTIVITY IN FOOD AND ELECTRON STERILIZATION.
AD-613 950 DIV. 29

•ISOTROPISM
ALKALI METALS
REPRINT: DEVIATIONS OF THE SPECIFIC HEATS OF THE ALKALI METALS FROM HARMONIC BEHAVIOUR. A POSSIBLE DEPENDENCE ON ISOTOPIC COMPOSITION OF THE ANHARMONIC CONTRIBUTION TO SPECIFIC HEAT.
AD-614 903 DIV. 25

•JET ENGINE FUELS
BIOLOGICAL CONTAMINATION
. COMPREHENSIVE BIBLIOGRAPHY FOR MECHANISM OF MICROBIOLOGICAL CONTAMINATION OF JET FUEL AND DEVELOPMENT OF TECHNIQUES FOR DETECTION OF MICROBIOLOGICAL CONTAMINATION. APPENDIX C.
AD-614 133 DIV. 10

•JET PLANES
ELECTROSTATIC FIELDS
MEASUREMENT OF ELECTROSTATIC CHARGE ON AIRCRAFT.
AD-614 060 DIV. 1

•JOINTS
VIBRATION
FLEXURAL-WAVE TRANSMISSION PROPERTIES OF PLATE-JOINT AND ROD-JOINT SYSTEMS.
AD-614 264 DIV. 25

•K MESONS
DECAY SCHEMES
REPRINT: SU(3) SYMMETRY AND THE NONLEPTONIC K-MESON PROCESSES.
AD-614 172 DIV. 20

SELECTION RULES
REPRINT: UNITARY SYMMETRY AND NON-LEPTONIC K-DECAYS.
AD-614 175 DIV. 20

•KIDNEYS
TRANSPLANTATION
REPRINT: IMPORTANCE OF PREVENTING RENAL VASCULAR COLLAPSE DURING PERIOD OF RENAL ISCHEMIA IN KIDNEY TRANS PLANTATION.

AD-619 298 DIV. 16

•KLYSTRONS
MICROWAVE AMPLIFIERS
HIGH POWER X-BAND GENERATOR.
AD-619 001 DIV. 8

•LABORATORY EQUIPMENT
THERMAL PROPERTIES
THEORIES OF THE DIFFERENTIAL-THERMAL-RESP. MAGNETOTHERMAL-ANALYSIS. A DETAILED DESCRIPTION OF THE TWO APPARATUS AND OF FURTHER MEASUREMENTS ON RE-MN-ALLOYS.
AD-619 469 DIV. 17

•LAMINAR BOUNDARY LAYER
VELOCITY
REPRINT: AN ESTIMATION LEMMA FOR LAMINAR COMPRESSIBLE BOUNDARY-LAYER VELOCITY PROFILES.
AD-619 159 DIV. 9

•LAMINATED PLASTICS
CHAR DEPTH IN FIBER-REINFORCED PLASTIC NOZZLE INSERTS.
AD-619 260 DIV. 27

•LANGUAGE
BIBLIOGRAPHIES
ANNOTATED BIBLIOGRAPHY OF RAND PUBLICATIONS IN COMPUTATIONAL LINGUISTICS.
AD-613 975 DIV. 32

SPEECH REPRESENTATION
SEMANTIC BASIS OF COMMUNICATION.
AD-619 093 DIV. 32

•LANGUAGES
DATA PROCESSING SYSTEMS
PRESERVATION OF UNAMBIGUITY AND INHERENT AMBIGUITY IN CONTEXT FREE LANGUAGES.
AD-619 073 DIV. 30

•LANTHANUM COMPOUNDS
ALUMINATES
HYDROTHERMAL GROWTH OF CRYSTALS OF LAALO3.
AD-619 229 DIV. 14

•LASERS
ABSORPTION SPECTRUM
REPRINT: A QUANTUM MECHANICAL EVALUATION OF LINE BREADTHS INVOLVED IN TUNED-LASER ABSORPTION AND STIMULATED EMISSION SPECTROSCOPY.
AD-619 383 DIV. 25

GASES
TUNABLE COHERENT LIGHT SOURCE.
AD-613 968 DIV. 25

GLASS
NEODYMIUM LASER GLASS IMPROVEMENT PROGRAM.
AD-613 963 DIV. 25

MAGNETIC FIELDS
REPRINT: HANLE EFFECT IN THE HE-NE LASER.
AD-619 360 DIV. 25

MOLECULAR PROPERTIES
REPRINT: LASER POSSIBILITIES OF CHEMICALLY EXCITED MOLECULES FORMED WITH ATOMIC SPECIES.
AD-619 324 DIV. 25
REPRINT: INVERTED POPULATION DISTRIBUTIONS PRODUCED BY CHEMICAL REACTIONS.
AD-619 329 DIV. 25

PHOTOCONDUCTIVITY
QUANTUM AND SOLID STATE ELECTRONICS.
AD-619 007 DIV. 25

RESONANCE
STUDY OF PLASMA AMPLIFIERS: USE OF RECOMBINATION RADIATION AT OPTICAL FREQUENCIES; OPTICAL RESONATOR MODES IN BROMINE-ARGON LASERS.
AD-619 253 DIV. 8

RUBY
REPRINT: CRITERIA FOR OPTICAL MASER AMPLIFIERS AND OSCILLATORS.
AD-619 209 DIV. 25

SCIENTIFIC RESEARCH
TECHNICCAL PROGRESS ON FUNDAMENTAL AND APPLIED RESEARCH PROGRAMS.
AD-619 042 DIV. 30
MICROWAVE RESEARCH: ACOUSTICS, LASERS, OPTICS, SEMICONDUCTORS, AND SOLID STATE PLASMA STUDIES.
AD-619 099 DIV. 25

SOLID STATE PHYSICS
SOLID STATE RESEARCH.
AD-613 961 DIV. 25

SPACE SURVEILLANCE SYSTEMS
CONTINUOUSLY PULSED LASER DEVICE FOR SURVEILLANCE.
AD-619 445 DIV. 25

•LEAD COMPOUNDS
SULFIDES
REPRINT: DIFFUSION OF SULFUR 35 IN SINGLE CRYSTALS OF LEAD SULFIDE AS A FUNCTION OF STOICHIOMETRY AND DOPING ADDITIONS.
AD-619 550 DIV. 25

•LEARNING
READING
REPRINT: SELF-EVALUATIONAL RESPONDING AND TYPOGRAPHICAL CUEING: TECHNIQUES FOR PROGRAMING SELF-INSTRUCTIONAL READING MATERIALS.
AD-619 316 DIV. 23
REPRINT: TYPOGRAPHICAL CUING IN CONVENTIONAL AND PROGRAMED TEXTS.
AD-619 317 DIV. 23

TEACHING MACHINES
PROGRAMMING METHOD AND RESPONSE MODE IN A VISUAL ORAL TASK.
AD-619 014 DIV. 28

•LEPTONS
DECAY SCHEMES
REPRINT: UNITARY SYMMETRY AND WEAK INTERACTIONS. II. SU(3) TRANSFORMATION PROPERTIES.
AD-619 154 DIV. 20

NUCLEAR REACTIONS
REPRINT: STRANGENESS NON-CONSERVING WEAK LEPTONIC INTERACTIONS.
AD-619 174 DIV. 20

•LIBRARIES
INDIA
REPRINT: CONVERSION ON INDIAN LIBRARIES.
AD-619 190 DIV. 32

•LIFE SUPPORT
GAS ANALYSIS
DEVELOPMENT OF A CARBON DIOXIDE PARTIAL PRESSURE SENSOR.
AD-619 226 DIV. 16

SUBMARINES
PRESENT STATUS OF CHEMICAL RESEARCH IN ATMOSPHERE PURIFICATION AND CONTROL ON NUCLEAR-POWERED SUBMARINES.
AD-619 261 DIV. 31

•LIFT
SPHERES
EXPERIMENTS ON THE LIFT AND DRAG OF SPHERES SUSPENDED IN A LOW REYNOLDS NO. POISEUILLE FLOW.
AD-613 939 DIV. 9

•LIGHT
ATMOSPHERIC REFRACTION
OPTICAL SCINTILLATION IN ATMOSPHERE.
AD-619 056 DIV. 2

LASERS
TUNABLE COHERENT LIGHT SOURCE.
AD-613 968 DIV. 25

REFLECTION
REPRINT: SIMPLE CONSTRUCTION FOR DETERMINING THE PHASE CHANGE OF LIGHT REFLECTED AT NORMAL INCIDENCE.
AD-619 309 DIV. 25

•LIGNINS
PLANTS (BOTANY)
REPRINT: PHENOLIC ACIDS AND LIGNINS IN THE LYCOPODIALES
AD-619 513 DIV. 4

•LINE SPECTRUM
LITHIUM
REPRINT: ANOMALOUS NUCLEAR MAGNETIC RESONANCE LINEWIDTH IN LITHIUM.
AD-619 365 DIV. 25

PRESSURE
RESEARCH ON MEASUREMENT OF PRESSURE INDUCED SHIFTS OF ABSORPTION LINES IN THE INFRARED SPECTRUM.
AD-619 234 DIV. 25

•LINEAR PROGRAMMING
COMBINATORIAL ANALYSIS
MULTIPHASE-DUAL ALGORITHM FOR THE ZERO-ONE INTEGER PROGRAMMING PROBLEM.
AD-619 121 DIV. 15

MATRIX ALGEBRA
REPRINT: DISTANCE MATRIX OF A GRAPH AND ITS REALIZABILITY.
AD-619 559 DIV. 15

REPLACEMENT THEORY
OPTIMAL RANDOMIZED REPLACEMENT UNDER MARKOVIAN DETERIORATION.
AD-619 120 DIV. 26

STOCHASTIC PROCESSES
SOME RESULTS AND PROBLEMS IN STOCHASTIC LINEAR PROGRAMMING.
AD-613 990 DIV. 15

•LIQUEFIED GASES
HELIUM
REPRINT: DENSITY OF LIQUID HELIUM-3 BETWEEN 0.045 AND 1.3K.
AD-619 376 DIV. 4

HYDROGEN
COLD-NEUTRON SCATTERING CROSS SECTION OF LIQUID HYDROGEN BASED ON A CONSISTENT-VIBRATIONS LIQUID MODEL.
AD-619 038 DIV. 25
CONSISTENT-VIBRATIONS MODEL OF THE INTERNAL DYNAMICS

OF LIQUID HYDROGEN.
AD-614 039 DIV. 25

•LIQUID CRYSTALS
TRANSLATION OF RUSSIAN RESEARCH: TYPE OF GROWTH AND PROPERTIES OF LIQUID CRYSTALS OF THIAZINE DYES.
AD-613 989 DIV. 25

•LIQUID ROCKET PROPELLANTS
RADIATION DAMAGE
CONSISTENT-VIBRATIONS MODEL OF THE INTERNAL DYNAMICS OF LIQUID HYDROGEN.
AD-614 039 DIV. 25

•LIQUIDS
CRYSTALS
TRANSLATION OF RUSSIAN RESEARCH: GROWTH OF SINGLE CRYSTALS NEMATIC FILMS.
AD-613 984 DIV. 25
TRANSLATION OF RUSSIAN RESEARCH: VITRIFIED LIQUID CRYSTAL FILMS.
AD-613 986 DIV. 25

THERMODYNAMICS
REACTION KINETICS, THE THEORY OF LIQUIDS, AND OPTICAL ROTATION.
AD-614 083 DIV. 4

•LITHIUM
HELIUM
REPRINT: RADIATIVE CAPTURE OF HE3 BY LI7.
AD-614 519 DIV. 20

NUCLEAR MAGNETIC RESONANCE
REPRINT: ANOMALOUS NUCLEAR MAGNETIC RESONANCE LINEWIDTH IN LITHIUM.
AD-614 369 DIV. 25

NUCLEAR SPINS
REPRINT: DETERMINATION OF THE SPIN OF LITHIUM 8 HYPER NUCLEUS.
AD-614 187 DIV. 20

•LIVER
HYPOTHERMIA
ATROPINE DETOXICATION DURING HYPOTHERMIA BY THE ISOLATED PERFUSED RAT LIVER.
AD-614 068 DIV. 16

•LOGISTICS
DESIGN
DESIGNER'S IMPACT ON LOGISTICS.
AD-614 057 DIV. 18

•LOW ALTITUDE
FLIGHT
ENVIRONMENTAL CONDITIONS TO BE CONSIDERED IN THE STRUCTURAL DESIGN OF AIRCRAFT REQUIRED TO OPERATE AT LOW LEVELS.
AD-614 460 DIV. 1

•LOW-PASS FILTERS
INSTRUCTION MANUALS
DTMB TYPE 337-1A ELECTRONIC LOW-PASS FILTER INSTRUCTION MANUAL.
AD-613 948 DIV. 8

•LUBRICANT ADDITIVES
FLUORINE COMPOUNDS
REDUCTION OF POLYMERIC FRICTION BY MINOR CONCENTRATIONS OF PARTIALLY FLUORINATED COMPOUNDS.
AD-614 099 DIV. 14

•LUBRICANTS
GRAPHITE
FRICTION AND WEAR BEHAVIOR OF SOLID FILMS.
AD-614 242 DIV. 14

LUBRICANT ADDITIVES
REDUCTION OF POLYMERIC FRICTION BY MINOR CONCENTRATIONS OF PARTIALLY FLUORINATED COMPOUNDS.
AD-614 099 DIV. 14

•LUMINESCENCE
SPECTROSCOPY
REPRINT: DETERMINATION OF RADIAL DISTRIBUTION OF VOLUME RADIANCE OF A LUMINOUS MEDIUM CONFINED IN A GLASS CYLINDER.
AD-614 328 DIV. 25

•LUNAR ENVIRONMENT
OPTICAL PROPERTIES
REPRINT: WAVELENGTH DEPENDENCE OF POLARIZATION. III. THE LUNAR SURFACE.
AD-614 170 DIV. 2

SIMULATION
STUDIES OF THE PHYSICAL CHARACTERISTICS OF PROBABLE LUNAR SURFACE MATERIALS: PART II.
AD-613 969 DIV. 2

•LUNGS
THROMBOSIS
REPRINT: PULMONARY MICROTHROMBI.
AD-614 349 DIV. 16

•MACHINE TOOLS
CONTROL SYSTEMS
TRANSLATION OF RUSSIAN PATENT ON SELF-ADJUSTING SYSTEM FOR PROGRAMMED CONTROL OF METAL-CUTTING MACHINE TOOLS.
AD-614 022 DIV. 30

•MACHINING
CERAMIC MATERIALS
MACHINING HIGH PURITY ALUMINA.
AD-614 467 DIV. 26

•MAGNESIUM
COMBUSTION
ESTIMATING METAL PARTICLE COMBUSTION KINETICS; ALUMINUM, BERYLLIUM, MAGNESIUM.
AD-614 363 DIV. 10

•MAGNESIUM ALLOYS
ATOMIC ENERGY LEVELS
ELECTRONIC STRUCTURE OF DILUTE SOLID SOLUTION ALLOYS OF 3DTRANSITION METALS IN A NON-MAGNETIC MATRIX.
AD-614 482 DIV. 25

CASTING ALLOYS
SILICON AND ZINC EFFECT ON MAGNESIUM-LITHIUM AND MAGNESIUM-LITHIUM-SILVER ALLOYS.
AD-614 422 DIV. 17

STABILITY
DIMENSIONAL STABILITY OF SELECTED ALLOY SYSTEMS.
AD-613 931 DIV. 17

•MAGNETIC FIELDS
PARTICLE TRAJECTORIES
TRANSLATION OF RUSSIAN RESEARCH: SIMULATION OF PARTICLE MOTION IN INTERSECTING ELECTRIC AND MAGNETIC FIELDS.
AD-613 980 DIV. 25

PRODUCTION
PRODUCTION OF INTENSE MAGNETIC FIELDS BY MEANS OF LIQUID NITROGEN COOLED COPPER COILS.
AD-613 967 DIV. 25

ROCKET NOZZLES
EFFECT OF AN INTENSE MAGNETIC FIELD ON ROCKET NOZZLE HEAT TRANSFER. PART I: THEORY AND SUPERCONDUCTING MAGNET EXPERIMENTS.
AD-613 992 DIV. 27

•MAGNETIC MOMENTS
DIPOLE MOMENTS
REPRINT: MAGNETIC DIPOLE MOMENTS OF ODD-MASS NUCLEI IN THE SPHERICAL REGION.
AD-614 496 DIV. 20

•MAGNETIC PROPERTIES
COLBALT COMPOUNDS
REPRINT: MAGNETIC AND ELECTRICAL ANOMALIES IN LACOO3.
AD-614 216 DIV. 25

GADOLINIUM
REPRINT: BAND STRUCTURE AND MAGNETISM OF GADOLINIUM METAL.
AD-614 557 DIV. 25

•MAGNETIC RECORDING SYSTEMS
TELEMETER SYSTEMS
SATELLITE CONTROL FACILITY, DESIGN CRITERIA: EXTENDING THE FREQUENCY RESPONSE OF THE REMOTE STATION TAPE RECORDER/REPRODUCER EQUIPMENT.
AD-614 003 DIV. 12

•MAGNETIC RESONANCE
FERROMAGNETIC MATERIALS
REPRINT: EVIDENCE OF UNPINNED SURFACE SPINS FROM PARALLEL SPIN-WAVE RESONANCES IN PERMALLOY FILMS.
AD-614 359 DIV. 25

SOLID STATE-PHYSICS
SOLID STATE RESEARCH.
AD-613 961 DIV. 25

•MAGNETIC STORMS
MAGNETOHYDRODYNAMICS
REPRINT: DISCUSSION OF PAPER BY E. J. STEGELMANN AND C. H. VON KENSCHITZKI, 'ON THE INTERPRETATION OF THE SUDDEN COMMENCEMENT OF GEOMAGNETIC STORMS'.
AD-614 168 DIV. 2

•MAGNETOHYDRODYNAMICS
BOUNDARY LAYER
TRANSLATION OF RUSSIAN RESEARCH: THE BOUNDARY LAYER ON A FLAT PLATE IN ANISOTROPIC MAGNETOHYDRODYNAMICS.
AD-614 391 DIV. 25

BOUNDARY VALUE PROBLEMS
THE FLOW OF A CONDUCTING GAS JET WITH ALIGNED MAGNETIC FIELD.
AD-614 420 DIV. 25

CALCULUS OF VARIATIONS
APPLICATION OF VARIATIONAL METHODS FOR THE SOLUTION OF GASDYNAMIC AND MAGNETOGASDYNAMIC PROBLEMS.
AD-614 051 DIV. 25

ENERGY CONVERSION
TRANSLATION OF RUSSIAN NEWSPAPER ARTICLE: PROGRESS TOWARDS THE CONTROL OF NUCLEAR REACTIONS.
AD-614 023 DIV. 20

GENERATORS
LONG LIFE CLOSED LOOP MHD RESEARCH AND DEVELOPMENT UNIT.
AD-614 458 DIV. 25

ONE-DIMENSIONAL FLOW
PRACTICAL EXAMPLES OF ONE DIMENSIONAL UNSTEADY POTENTIAL FLOWS IN MAGNETOGASDYNAMIC PROBLEMS.
AD-614 092 DIV. 25

STABILITY
TRANSLATION OF RUSSIAN RESEARCH: STABILITY OF A FLAT LAYER OF INEALLY-CONDUCTING VISCOUS FLUID IN A LONGITUDINAL MAGNETIC FIELD.
AD-614 026 DIV. 25

TWO-DIMENSIONAL FLOW
INTERPRETATION OF MAGNETO GASDYNAMIC FLOW PATTERNS.
AD-614 090 DIV. 25

•MAGNETO-OPTIC EFFECT
SOLIDS
REPRINT: FARADAY EFFECT IN SOLIDS.
AD-614 558 DIV. 25

•MANAGEMENT CONTROL SYSTEMS
COSTS
COST ACCOUNTING PROBLEMS IN THE PERT COST SYSTEM.
AD-614 408 DIV. 26

•MANAGEMENT ENGINEERING
BIBLIOGRAPHIES
SELECTED BIBLIOGRAPHY OF PUBLICATIONS, PAPERS, AND REPORTS IN THE SOCIAL, BEHAVIORAL, AND ADMINISTRATIVE SCIENCES.
AD-614 066 DIV. 32

LOGISTICS
DESIGNER'S IMPACT ON LOGISTICS.
AD-614 057 DIV. 18

•MANGANESE ALLOYS
INTERMETALLIC COMPOUNDS
X-RAY-, DTA-, AND THERM OMAGNETIC ANALYSIS OF MANGANESE INTERMETALLIC COMPOUNDS.
AD-614 466 DIV. 17

RARE EARTH ELEMENTS
INVESTIGATIONS OF THE SYSTEMS Y-MN, GD-MN AND SM-MN.
AD-614 462 DIV. 17
COMPOUNDS DYMN2, HOMN2 AND ERMN2. CALCULATION OF THE ENERGY AND FREE ENTHALPY OF FORMATION OF RE-MERCURYCOMPOUNDS BY VAPOUR PRESSURE MEASUREMENTS AND THERMAL ANALYSIS.
AD-614 463 DIV. 25
SINTER PROCESS, USING MERCURY AS AN 'AUXILIARY COMPONENT' AS APPLIED TO RE-MN SYSTEMS. DIFFERENTIAL-THERMALAND MAGNETO-THERMAL-ANALYSIS OF THE SYSTEM GD-MN (0 -90% W.% MN).
AD-614 464 DIV. 17
THEORIES OF THE DIFFERENTIAL-THERMAL-RESP. MAGNETOTHERMAL-ANALYSIS. A DETAILED DESCRIPTION OF THE TWO APPARATUS AND OF FURTHER MEASUREMENTS ON RE-MN-ALLOYS.
AD-614 465 DIV. 17

•MAPPING
PLASTICS
TRANSLATION OF RUSSIAN RESEARCH: USE OF TRANSPARENT PLASTICS IN STEREOTOPOGRAPHIC WORK.
AD-614 106 DIV. 2

•MARINE GEOLOGY
BRITISH COLUMBIA
REPRINT: VARVED MARINE SEDIMENTS IN A STAGNANT FJORD.
AD-614 227 DIV. 2

FLORIDA
MARINE GEOLOGY AND OCEANO GRAPHY OF FLORIDA BAY, APALACHICOLA BAY AND VIC INITY, FLORIDA.
AD-614 427 DIV. 2

•MARINE GEOPHYSICS
SEISMOLOGY
COMPUTER PROGRAM FOR ROUTINE LOCATION OF T-PHASE SOURCES IN THE PACIFIC OCEAN.
AD-614 279 DIV. 2

TERRESTRIAL MAGNETISM
STUDY OF AEROMAGNETIC DATA, NEW ENGLAND SEAMOUNT AREA.
AD-614 117 DIV. 2

•MARINE METEOROLOGY
STORMS
REPRINT: COASTAL STORMS OF THE EASTERN UNITED STATES.
AD-614 189 DIV. 2

•MARTENSITE
HARDENING
ROLE OF CARBON AND FINE STRUCTURE IN THE HARDENING OF IRON-NICKEL-CARBON MARTENSITES.
AD-614 447 DIV. 17

TRANSFORMATIONS
THERMODYNAMICS OF MARTENSITIC F. C. C. REVERSIBLY YIELDS B. C. C. AND F. C. C. REVERSIBLY YIELDS H. C. P. TRANSFORMA TIONS IN THE IRON-RUTHENIUM SYSTEM.
AD-614 009 DIV. 17

•MATERIALS
PHOTOELASTICITY
TRANSLATION OF JAPANESE RESEARCH: SOME NEW FREEZE PHOTOELASTIC MATERIALS AND THEIR APPLICATION.
AD-614 278 DIV. 14

•MATHEMATICAL LOGIC
ELECTRICAL NETWORKS
REPRINT: A SYMBOLIC NOTATION APPLIED TO UNBALANCED LADDER NETWORKS.
AD-614 191 DIV. 8

•MATHEMATICAL MODELS
URBAN PLANNING
ON COMPUTER MODELS AND URBAN PLANNING.
AD-614 419 DIV. 30

•MATHEMATICAL PREDICTION
ELECTRONIC EQUIPMENT
ELECTRONIC SYSTEM RELIABILITY PREDICTION BY FUNCTION.
AD-614 227 DIV. 8

•MATHEMATICS
PRINTING
A GUIDE TO THE TYPING OF MATHEMATICAL NOTATION.
AD-613 942 DIV. 24

•MATRIX ALGEBRA
GRAPHICS
REPRINT: DISTANCE MATRIX OF A GRAPH AND ITS REALIZABILITY.
AD-614 559 DIV. 15

•MEASURE THEORY
SET THEORY
REPRINT: CONSISTENT ESTIMATES AND ZERO-ONE SETS.
AD-613 917 DIV. 15

•MEASURING DEVICES (ELECTRICAL AND ELEC
POLAROGRAPHIC ANALYSIS
REPRINT: OPERATIONAL AMPLIFIER CIRCUITS FOR CONTROLLED POTENTIAL CYCLIC VOLTAMMETRY, II.
AD-614 195 DIV. 4

•MECHANICS
TRANSFORMATIONS (MATHEMATICAL)
THE GENERALIZATION OF HAMILTON'S MECHANICS. I, THEORY OF HOMOGENEOUS CONTACT TRANSFORMATIONS.
AD-614 029 DIV. 25

•MELANESIA
VEGETABLE OILS
REPRINT: COMPONENTS OF THE OIL OF ARAUCARIA.
AD-614 524 DIV. 4

•MENTAL DISORDERS
PHARMACOLOGY
TRANSLATION OF RUSSIAN RESEARCH: INFLUENCE OF CERTAIN PHARMACOLOGICAL PREPAR ATIONS ON THE BIOELECTRIC ACTIVITY OF THE BRAIN IN SCHIZ OPHRENIA.
AD-614 403 DIV. 16

PHYSIOLOGY
REPRINT: PHYSIOLOGICAL CORRELATES OF MENTAL DISEASE.
AD-614 148 DIV. 16

•MERCURY ALLOYS
TELLURIUM ALLOYS
REPRINT: ELASTIC CONSTANTS OF HGTE.
AD-614 308 DIV. 25

•MESON REACTIONS
K MESONS
REPRINT: SU(3) SYMMETRY AND THE NONLEPTONIC K-MESON PROCESSES.
AD-614 172 DIV. 20

MATHEMATICAL MODELS
REPRINT: STRANGENESS NON-CONSERVING WEAK LEPTONIC INTERACTIONS.
AD-614 174 DIV. 20

NEUTRON CAPTURE
REPRINT: MESON EFFECTS IN N-P CAPTURE.
AD-614 151 DIV. 20

N-BODY PROBLEM
REPRINT: ENERGY PEAKS FOR THREE-BODY MESON SYSTEMS.
AD-614 150 DIV. 20

SELECTION RULES
REPRINT: UNITARY SYMMETRY AND NON-LEPTONIC K-DECAYS.
AD-614 175 DIV. 20

•MESON SCATTERING
INTEGRAL EQUATIONS
REPRINT: SCATTERING, WEAK DECAYS, AND FINAL-STATE INTERACTIONS IN MODEL THEORIES IN A DRESSED-PARTICLE PICTURE.
AD-614 375 DIV. 20

NUCLEONS
NATURE OF THE RESONANCE IN THE STATIC PION-NUCLEON SCATTERING IN ONE-MESON APPROX IMATION.
AD-613 934 DIV. 20

PIONS
REPRINT: CROSSING RELATIONS AND LEGENDRE EXPANSIONS IN PION-PION SCATTERING.
AD-614 153 DIV. 20

•MESONS
BARYONS
REPRINT: MESON-BARYON SYSTEMS AND THEIR RESONANCES.
AD-619 192 DIV. 20

DECAY SCHEMES
REPRINT: THE PHI-OMEGA MIXING ANGLE.
AD-619 171 DIV. 20

•METABOLISM
CARBON COMPOUNDS
METABOLISM OF SIMPLE CARBON COMPOUNDS IN MICRO ORGANISMS.
AD-619 479 DIV. 16

INORGANIC COMPOUNDS
ON THE ASSIMILATION OF ENERGY FROM INORGANIC SOURCES IN AUTOTROPHIC FORMS OF LIFE.
AD-619 299 DIV. 16

•METAL FILMS
FERROMAGNETIC MATERIALS
REPRINT: EVIDENCE OF UNPINNED SURFACE SPINS FROM PARALLEL SPIN-WAVE RESONANCES IN PERMALLOY FILMS.
AD-619 359 DIV. 25

SUPERCONDUCTORS
REPRINT: EFFECT OF MAGNETIC FIELD ON THERMAL CONDUCTIVITY AND ENERGY GAP OF SUPERCONDUCTING FILMS.
AD-619 369 DIV. 25

•METALATION
FERROCENES
REPRINT: RING METALATION OF DIMETHYLAMINOMETHYLFERROCENE WITH BUTYLLITHIUM AND CONDENSATIONS WITH ELECTROPHILIC COMPOUNDS. SYNTHESIS OF 1,2-DISUBSTITUTED FERROCENES.
-619 944 DIV. 4

•METALORGANIC COMPOUNDS
SYNTHESIS (CHEMISTRY)
REPRINT: NEW TRIPHENYL PHOSPHINE HYDRIDES OF RHENIUM (NUOVI IDRURI TRIFENILFO SFINICI DI RENIO).
AD-619 207 DIV. 4

•METALS
CRYSTALLIZATION
REPRINT: THERMAL CONVECTION DURING HORIZONTAL SOLIDIFICATION OF PURE METALS AND ALLOYS.
AD-619 182 DIV. 17

FATIGUE (MECHANICS)
TRANSLATION OF RUSSIAN RESEARCH: MECHANICAL AND THERMAL FATIGUE OF METALS BY THE INTERNAL FRICTION METHOD.
AD-619 019 DIV. 17

•METAMORPHIC ROCK
PHASE STUDIES
REPRINT: THE BASALT-ECLOGITE TRANSFORMATION AND CRUSTAL STRUCTURE IN THE WESTERN UNITED STATES.
AD-619 303 DIV. 2

•METEORITES
LANDING IMPACT
TRANSLATION OF RUSSIAN RESEARCH: ON THE PROPAGATION OF A SHOCK WAVE IN THE GROUND DURING IMPACT OF A VERY FAST METEORITE AGAINST THE SURFACE OF THE PLANET.
AD-619 018 DIV. 2

SCIENTIFIC RESEARCH
SCIENTIFIC STUDY OF METEORS IN THE 19TH CENTURY.
AD-619 411 DIV. 2

•METEOROLOGICAL INSTRUMENTS
RADIOSONDES
TRANSLATION OF RUSSIAN RESEARCH: CALIBRATION OF RADIOSONDES AT TEMPERATURES TO MINUS 100 DEGREES C.
AD-613 979 DIV. 2

•METEOROLOGY
RESEARCH PROGRAM ADMINISTRATION
SOURCES OF METEOROLOGICAL DATA FOR WEAPONS SYSTEMS STUDIES.
AD-619 262 DIV. 22

•METEORS
SCIENTIFIC RESEARCH
SCIENTIFIC STUDY OF METEORS IN THE 19TH CENTURY.
AD-619 411 DIV. 2

•METHANE
MOLECULAR PROPERTIES
REPRINT: ANHARMONICITY CORRECTION FOR POLYATOMIC MOLECULES. PART II. METHANE.
AD-619 088 DIV. 25

THERMODYNAMICS
REPRINT: EXCESS THERMODYNAMIC FUNCTIONS FOR LIQUID MIXTURES OF METHANEPROPANE.
AD-619 517 DIV. 4

•METHYLENE BLUE
DECABORANES
REPRINT: METHYLENE BLUE IN THE TREATMENT OF DECABORANE TOXICITY.
AD-619 333 DIV. 16

•MEXICO
GEOGRAPHY
TRINCHERAS AND PHYSICAL ENVIRONMENT ALONG THE RIO GAVILAN, CHIHUAHUA, MEXICO.
AD-619 491 DIV. 2

•MICROANALYSIS
ORGANIC PHOSPHORUS COMPOUNDS
TRANSLATION OF RUSSIAN RESEARCH: APPROXIMATE ENZYMIC METHOD OF MICROANALYSIS FOR IDENTIFYING RESIDUAL AMOUNTS OF ORGANOPHOSPHORUS INSECTICIDES.
AD-619 396 DIV. 4

•MICROMINIATURIZATION (ELECTRONICS)
NAVAL EQUIPMENT
MICRO-NOTES. INFORMATION OF MICROELECTRONICS FOR NAVY AVIONICS EQUIPMENT.
AD-619 116 DIV. 8

•MICROPHONES
ERRORS
TRANSDUCERS FOR SONIC FATIGUE MEASUREMENTS.
AD-613 996 DIV. 30

•MICROWAVE AMPLIFIERS
CROSSED FIELD DEVICES
DEVELOPMENT OF AN X-BAND CW CROSSED-FIELD AMPLIFIER.
AD-619 251 DIV. 8

L BAND
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-613 994 DIV. 8
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-613 995 DIV. 8
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-619 055 DIV. 8

PLASMA PHYSICS
STUDY OF PLASMA AMPLIFIERS: USE OF RECOMBINATION RADIATION AT OPTICAL FREQUENCIES; OPTICAL RESONATOR MODES IN BROMINE-ARGON LASERS.
AD-619 253 DIV. 8

THEORY
VELOCITY TAPERING IN MICROWAVE AMPLIFIERS.
AD-619 244 DIV. 8

X-BAND
HIGH POWER X-BAND GENERATOR.
AD-619 001 DIV. 8

•MICROWAVE EQUIPMENT
CESIUM ELECTRON TUBES
PRODUCTION ENGINEERING MEASURE FOR CESIUM BEAM TUBES.
AD-619 118 DIV. 8

DESIGN
PROPERTIES OF STRIP TRANSMISSION LINE, VOLUME I.
AD-619 035 DIV. 8
PROPERTIES OF STRIP TRANSMISSION LINE, VOLUME II.
AD-619 036 DIV. 8

DIELECTRICS
MICROWAVE NONLINEAR DIELECTRIC MATERIALS.
AD-619 274 DIV. 14

FERRITES
STUDY OF PARALLEL PUMPING IN MICROWAVE FERRITES.
AD-619 045 DIV. 8

QUANTUM MECHANICS
REPRINT: RESONANT FREQUENCY MIXING EFFECTS IN DISTRIBUTED MEDIA.
AD-619 208 DIV. 25

SEMICONDUCTORS
NEW CONCEPTS FOR SOLID STATE MICROWAVE GENERATORS; SURFACE CONTROLLED MICROWAVE AVALANCHE TRANSISTOR.
AD-619 000 DIV. 8

•MICROWAVE FREQUENCY
SCIENTIFIC RESEARCH
MICROWAVE RESEARCH: ACOUSTICS, LASERS, OPTICS, SEMICONDUCTORS, AND SOLID STATE PLASMA STUDIES.
AD-619 099 DIV. 25

•MICROWAVE SPECTROSCOPY
CYANOGEN
REPRINT: OPTICAL DETECTION OF MICROWAVE TRANSITIONS BETWEEN EXCITED ELECTRONIC STATES OF CN AND THE IDENTIFICATION OF THE TRANSITIONS INVOLVED.
AD-619 553 DIV. 25

SPECTRUM ANALYZERS
DIELECTRIC DISPERSION: MICROWAVE SPECTROMETER MODIFICATIONS.
AD-613 933 DIV. 25

•MILITARY PERSONNEL
ABNORMAL PSYCHOLOGY
REPRINT: MODES OF COMMUNICATION USED BY MILITARY PATIENTS DIAGNOSED AS SCHIZOPHRENIC (ACUTE), AS ALCOHOLIC (CHRONIC) AND BY MILITARY OFFENDERS (AWOL).
AD-619 562 DIV. 28

•MILITARY PSYCHOLOGY
MILITARY PERSONNEL
REPRINT: MODES OF COMMUNICATION USED BY MILITARY

PATIENTS DIAGNOSED AS SCHIZOPHRENIC (ACUTE), AS ALCOHOLIC (CHRONIC) AND BY MILITARY OFFENDERS (AWOL).
AD-619 562 DIV. 28

•MILLIMETER WAVES
OSCILLATORS
MILLIMETER WAVE GENERATION BY MULTIPLE QUANTUM CONVERSION.
AD-619 092 DIV. 8

•MINERALS
ANALYSIS
REPRINT: CHARACTERISTICS OF BLACK SPHERULES ON THE GREENLAND ICE SHEET.
AD-619 188 DIV. 2

•MODEL (SIMULATIONS)
FLUID MECHANICS
THE VELOCITY FIELD DOWNSTREAM FROM A TWO-DIMENSIONAL MODEL HILL.
AD-619 067 DIV. 9

•MOLECULAR BEAMS
LABORATORY EQUIPMENT
TRANSLATION OF RUSSIAN RESEARCH: OBTAINING INTENSIVE MOLECULAR BEAM.
AD-619 393 DIV. 20

SCATTERING
MOLECULAR BEAM VELOCITY DISTRIBUTION MEASUREMENTS.
AD-619 230 DIV. 9
REPRINT: BEAMS OF HELIUM ATOMS AT TEMPERATURES BELOW 0.5 K.
AD-619 373 DIV. 25

•MOLECULAR PROPERTIES
FIELD THEORY
MIT SOLID-STATE AND MOLECULAR THEORY GROUP PROGRESS REPORT.
AD-619 996 DIV. 25

•MOLECULAR ROTATION
THEORY
REACTION KINETICS, THE THEORY OF LIQUIDS, AND OPTICAL ROTATION.
AD-619 083 DIV. 4

•MOLECULAR SPECTROSCOPY
HYDROCARBONS
REPRINT: LABORATORY INVESTIGATIONS OF THE INTERSTELLAR RADIO-FREQUENCY LINES OF CH AND OTHER MOLECULES.
AD-619 318 DIV. 4

MATHEMATICAL ANALYSIS
REPRINT: ANHARMONICITY CORRECTION FOR POLYATOMIC MOLECULES. METHODS AND APPLICATION TO FORMALDEHYDE.
AD-619 177 DIV. 25

•MOLECULAR STRUCTURE
ELECTRON DIFFRACTION ANALYSIS
REPRINT: AUTO-AND CROSS-CORRELATION FUNCTIONS USED AS TOOLS FOR INFORMATION RETRIEVAL IN ELECTRON DIFFRACTION STRUCTURE STUDIES.
AD-619 534 DIV. 25

•MOLECULES
TRANSPORT THEORY
OCCURRENCE OF BINARY COLLISIONS OF THREE HARD SPHERES IN A MOLECULAR MODEL.
AD-619 294 DIV. 25

•MOLYBDENUM
SINTERING
EFFECT OF HEAT TREATMENT ON THE MICROSTRUCTURE AND PROPERTIES OF SPRAYED MOLYBDENUM.
AD-619 127 DIV. 26

•MOLYBDENUM ALLOYS
NEUTRON DIFFRACTION ANALYSIS
REPRINT: NEUTRON DIFFR ACTION STUDIES OF THE ORDER OF THE ATOMS IN THE P PHASE AND THE R PHASE.
AD-619 149 DIV. 25

•MONITORS
OCEANOGRAPHIC EQUIPMENT
DEVELOPMENT AND TESTING OF TAUT-NYLON MOORED INSTRUMENT STATIONS (WITH DETAILS OF DESIGN AND CONSTRUCTION).
AD-619 427 DIV. 2

REMOTE CONTROL SYSTEMS
PROCEEDINGS OF THE SYMPOSIUM ON REMOTE SENSING OF ENVIRONMENT (3RD), 14-16 OCTOBER 1964.
AD-619 032 DIV. 30

WEIGHTLESSNESS
MECHANICAL DEVICE FOR SENSING ZERO G OR WEIGHTLESSNESS.
AD-619 937 DIV. 22

•MONOCYCLIC COMPOUNDS
FLUORINE COMPOUNDS
REPRINT: ANALYSIS OF COMPLEX NUCLEAR MAGNETIC RESONANCE SPECTRA FOR SYMMETRICAL TRIFLUOROBENZENE, THE AA'A'' XX'X'' SYSTEM.
AD-619 507 DIV. 20

•MOON
OPTICAL PROPERTIES
REPRINT: WAVELENGTH DEPENDENCE OF POLARIZATION. III. THE LUNAR SURFACE.
AD-619 170 DIV. 2

PHYSICAL PROPERTIES
STUDIES OF THE PHYSICAL CHARACTERISTICS OF PROBABLE LUNAR SURFACE MATERIALS: PART II.
AD-619 969 DIV. 2

SURFACE PROPERTIES
REPRINT: A MODEL OF THE LUNAR SURFACE.
AD-619 169 DIV. 2

TELEVISION COMMUNICATION SYSTEMS
TRANSLATION OF RUSSIAN RESEARCH: EXPERIMENTS IN TELEVISION PHOTOGRAPHY OF THE MOON IN THE 0.8-1.1 AND 0.8-2.3 MICRON RANGE.
AD-619 395 DIV. 2

•MOSSBAUER EFFECT
RESONANCE SCATTERING
REPRINT: DETERMINATION OF RECOILLESS FRACTIONS FROM MOSSBAUER SCATTERING.
AD-619 368 DIV. 20

•MULTIPLE BEAM ANTENNAS
DESIGN
INVESTIGATION OF A MULTIPLE BEAM SCANNING CIRCULAR ARRAY.
AD-619 288 DIV. 8

•MUSCLES
ELECTRICAL PROPERTIES
CORRELATIONAL STUDY OF MYOPOTENTIAL RESPONSE AND FORCE OF MUSCLE CONTRACTION DURING VARYING ACTIVITY DEMANDS.
AD-619 930 DIV. 30

METABOLISM
DPN-LINKED CYTOPLASMIC METABOLITES IN THE RAT-LEG MUSCLE, IN SITU, DURING CONTRACTION AND RECOVERY.
AD-619 246 DIV. 16

•MUSTARD AGENTS
ESCHERICHIA COLI
ELIMINATION OF SULFUR MUSTARD-INDUCED ALKYLATION PRODUCTS FROM DNA OF ESCHERICHIA COLI.
AD-619 267 DIV. 16
UNBALANCED GROWTH AND LATENT KILLING OF ESCHERICHIA COLI FOLLOWING EXPOSURE TO SULFUR MUSTARD.
AD-619 284 DIV. 16

•NAVAL EQUIPMENT
MICROMINIATURIZATION (ELECTRONICS)
MICRO-NOTES. INFORMATION OF MICROELECTRONICS FOR NAVY AVIONICS EQUIPMENT.
AD-619 116 DIV. 8

•NAVAL SHORE ESTABLISHMENTS
PIPES
PIPE CORROSION AT NAVAL ACTIVITIES.
AD-619 259 DIV. 13

•NAVIGATION COMPUTERS
OPERATION
NAVIGATIONAL CAPABILITY FOR PROGRAM 665A WITH AN/ASN24V(MOD) DIGITAL COMPUTER.
AD-619 941 DIV. 19

•NAVIGATION SATELLITES
OPTICAL TRACKING
PROJECT ANNA (GEODETIC SATELLITE) OPTICAL OBSERVATIONS.
AD-619 938 DIV. 2

SYSTEMS ENGINEERING
REPRINT: TRANSIT NAVIGA TIONAL SATELLITE SYSTEM.
AD-619 162 DIV. 19

•NEODYMIUM COMPOUNDS
LASERS
NEODYMIUM LASER GLASS IMPROVEMENT PROGRAM.
AD-619 963 DIV. 25

•NEON
LASERS
REPRINT: HANLE EFFECT IN THE HE-NE LASER.
AD-619 360 DIV. 25

•NEOPLASMS
HISTOLOGY
REPRINT: DIFFERENTIATION OF NEVOID BASAL CELL CARCINOMA FROM EPITHELIOMA ADENOIDES CYSTICUM: A CLINICOPATHOLOGIC AND HISTOCHEMICAL STUDY.
AD-619 353 DIV. 16

•NERVOUS SYSTEM
DEGRADATION
REPRINT: SPONGY DEGENE RATION OF THE NERVOUS SYSTEM.
AD-619 337 DIV. 16

•NEUTRINOS
SUN
REPRINT: NEUTRINO-SPECTROSCOPY OF THE SOLAR INTERIOR.
AD-619 323 DIV. 2

•NEUTRON BEAMS
VELOCITY
REPRINT: THE RESOLUTION FUNCTION OF A TWO-ROTOR NEUTRON VELOCITY SELECTOR.
AD-619 221 DIV. 20

•NEUTRON CAPTURE
PROTON CAPTURE
REPRINT: MESON EFFECTS IN N-P CAPTURE.
AD-619 251 DIV. 20

•NEUTRON CROSS SECTIONS
INELASTIC SCATTERING
INTERACTIONS OF 14.6-MEV NEUTRONS IN IRON, LITHIUM-7, AND CARBON.
AD-614 451 DIV. 20

•NEUTRON DETECTORS
NEUTRON BEAMS
REPRINT: THE RESOLUTION FUNCTION OF A TWO-ROTOR NEUTRON VELOCITY SELECTOR.
AD-614 221 DIV. 20

•NEUTRON DIFFRACTION ANALYSIS
CRYSTAL LATTICES
REPRINT: NEUTRON DIFFR ACTION STUDIES OF THE ORDER OF THE ATOMS IN THE P PHASE AND THE R PHASE.
AD-614 149 DIV. 25

•NEUTRON SCATTERING
HYDROGEN
COLD-NEUTRON SCATTERING CROSS SECTION OF LIQUID HYDROGEN BASED ON A CONSISTENT-VIBRATIONS LIQUID MODEL.
AD-614 038 DIV. 25

•NEUTRON TRANSPORT THEORY
SHIELDING
FORMULATION OF RADIATION TRANSPORT SOLUTIONS FOR SHIELDING APPLICATIONS, INCLUDING INTEGRAL TRANSFORM METHODS, MATRIX TECHNIQUES, AND ASYMPTOTIC APPROXIMATIONS.
AD-614 250 DIV. 20

•NICKEL ALLOYS
STABILITY
DIMENSIONAL STABILITY OF SELECTED ALLOY SYSTEMS.
AD-613 931 DIV. 17

•NICKEL COMPOUNDS
MONOXIDES
FABRICATION AND FRACTURE OF POLYCRYSTALLINE NIO.
AD-614 263 DIV. 14

•NIOBIUM
SUPERCONDUCTIVITY
REPRINT: INFLUENCE OF CONTROLLED ADDITIONS OF OXYGEN ON THE SUPERCONDUCTIVITY OF NIOBIUM.
AD-614 296 DIV. 25

•NIOBIUM ALLOYS
HIGH TEMPERATURE RESEARCH
TRANSLATION OF RUSSIAN RESEARCH: INVESTIGATING OXIDATIONS OF NIOBIUM-TITANIUM-ZIRCONIUM ALLOYS.
AD-614 017 DIV. 17

•NITRAMINES
MOLECULAR ISOMERISM
REPRINT: REARRANGEMENT OF AROMATIC N-NITROAMINES. ACID-CATALYSED REARRANGEMENT OF N-NITROANILINE.
AD-614 219 DIV. 4

•NITROBENZENES
FREE RADICALS
REPRINT: VOLTAMMETRY AND ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF HALONITRO BENZENE ANION RADICALS.
AD-614 291 DIV. 4

NUCLEAR PARAMAGNETIC RESONANCE
REPRINT: CORRELATION OF SOLVENT EFFECTS OF ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF THE NITROBENZENE ANION RADICAL.
AD-613 924 DIV. 4

•NITROGEN
RECOMBINATION REACTIONS
REPRINT: ELECTRON-ION RECOMBINATION IN NITROGEN.
AD-614 160 DIV. 2

VOLUMETRIC ANALYSIS
REPRINT: COULOMETRIC DETERMINATION OF PROTEIN NITROGEN.
AD-614 341 DIV. 16

•NITROGEN COMPOUNDS
ABSORPTION SPECTRUM
REPRINT: CHARGE-TRANSFER ABSORPTION SPECTRA OF NO IN KR AND CH3OH SOLUTIONS.
AD-614 552 DIV. 25

FLUORIDES
ELECTROCHEMICAL STUDIES IN THE SYNTHESIS OF N-F COMPOUNDS: ELECTRODE AND HF HANDLING EQUIPMENT DEVELOP MENT.
AD-614 098 DIV. 4

•NONEQUILIBRIUM FLOW
NUMERICAL ANALYSIS
TECHNIQUES FOR SOLVING NONEQUILIBRIUM EXPANDING FLOW PROBLEMS.
AD-614 457 DIV. 9

•NONLINEAR SYSTEMS
MATRIX ALGEBRA
SUPERPOSITION IN A CLASS OF NONLINEAR SYSTEMS.
AD-614 483 DIV. 15

•NON-DESTRUCTIVE TESTING
ULTRASONIC RADIATION
TRANSLATION OF RUSSIAN PATENT: ULTRASONIC FLAW DETECTOR.
AD-614 397 DIV. 30

•NOZZLE INSERTS
LAMINATED PLASTICS
CHAR DEPTH IN FIBER-REINFORCED PLASTIC NOZZLE INSERTS.
AD-614 260 DIV. 27

•NUCLEAR ENERGY LEVELS
FLUORINE
REPRINT: THE EFFECT OF THE 2.10 MEV STATE OF F17 ON THE O16 (P, GAMMA) REACTION.
AD-614 204 DIV. 20

LITHIUM
REPRINT: RADIATIVE CAPTURE OF HE3 BY LI7.
AD-614 515 DIV. 20

•NUCLEAR ISOBARS
RESONANCE SCATTERING
REPRINT: ISOBAR MECHANISM AND RESONANCE POLES FOR PION. BARYON SYSTEMS.
AD-614 143 DIV. 20

•NUCLEAR MAGNETIC RESONANCE
AMMONIA
REPRINT: PREPARATION AND PROTON MAGNETIC RESONANCE STUDIES OF ANHYDROUS AMMONIA.
AD-614 377 DIV. 25

ANALYSIS
REPRINT: ANALYSIS OF COMPLEX NUCLEAR MAGNETIC RESONANCE SPECTRA FOR SYMMETRICAL TRIFLUOROBENZENE, THE AA'A'' XX'X'' SYSTEM.
AD-614 507 DIV. 20

GRAPHITE
REPRINT: ESR MEASUREMENT OF SPIN SUSCEPTIBILITY OF GRAPHITE IN A LOW MAGNETIC FIELD.
AD-614 366 DIV. 20

LITHIUM
REPRINT: ANOMALOUS NUCLEAR MAGNETIC RESONANCE LINEWIDTH IN LITHIUM.
AD-614 365 DIV. 25

•NUCLEAR PARAMAGNETIC RESONANCE
NITROBENZENE
REPRINT: CORRELATION OF SOLVENT EFFECTS OF ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF THE NITROBENZENE ANION RADICAL.
AD-613 924 DIV. 4

•NUCLEAR PARTICLES
NUCLEAR SCATTERING
REPRINT: PHASE-SHIFT EQUATIONS FOR MANY-CHANNEL PROBLEMS.
AD-614 167 DIV. 20

N-BODY PROBLEM
REPRINT: PRACTICLE THEORY OF THREE-PARTICLE STATES. I. NONRELATIVISTIC.
AD-614 493 DIV. 20

•NUCLEAR PHYSICS
POWER SUPPLIES
TRANSLATION OF RUSSIAN NEWSPAPER ARTICLE: PROGRESS TOWARDS THE CONTROL OF NUCLEAR REACTIONS.
AD-614 023 DIV. 20

•NUCLEAR POWERED VESSELS
LIFE SUPPORT
PRESENT STATUS OF CHEMICAL RESEARCH IN ATMOSPHERE PURIFICATION AND CONTROL ON NUCLEAR-POWERED SUBMARINES.
AD-614 261 DIV. 31

•NUCLEAR RADIATION
RADIATION MEASUREMENT SYSTEMS
TECHNIQUES FOR MEASURING EFFECTS OF NUCLEAR RADIATION ON MATERIALS AND COMPONENTS.
AD-614 109 DIV. 16

•NUCLEAR REACTIONS
NUCLEONS
REPRINT: ANALYSIS OF NUCLEON TRANSFER DATA.
AD-614 089 DIV. 20

•NUCLEAR REACTORS
PROGRAM (COMPUTERS)
COMPUTER CODES FOR REACTOR AND HAZARD ANALYSIS AT THE NUCLEAR AEROSPACE RESEARCH FACILITY.
AD-613 983 DIV. 30

SPACECRAFT NUCLEAR PROPULSION
CAVITY NUCLEAR REACTORS.
AD-613 998 DIV. 21

•NUCLEAR RESONANCE
BARYONS
REPRINT: MESON-BARYON SYSTEMS AND THEIR RESONANCES.
AD-614 152 DIV. 20

•NUCLEAR SCATTERING
ELECTRON BEAMS
ELECTRON SCATTERING ON NUCLEONS, THREE-BODY NUCLEI, AND CA40.
AD-614 270 DIV. 20

PIONS
REPRINT: SCATTERING OF PIONS BY LIGHT NUCLEI.
AD-614 087 DIV. 20

•NUCLEAR SPECTROSCOPY

MESON REACTIONS
REPRINT: ENERGY PEAKS FOR THREE-BODY MESON SYSTEMS.
AD-614 150 DIV. 20

•NUCLEAR SPINS
LITHIUM
REPRINT: DETERMINATION OF THE SPIN OF LITHIUM 8 HYPER NUCLEUS.
AD-614 187 DIV. 20

•NUCLEAR STRUCTURE
GROUPS (MATHEMATICS)
REPRINT: COUPLING OF INTERNAL AND SPACE-TIME SYMMETRIES.
AD-614 181 DIV. 20

•NUCLEAR WARFARE
FOREST FIRES
PROBABILITY OF EFFECTIVE POST-ATTACK FIRE FIGHTING IN WILDLANDS.
AD-614 488 DIV. 13

•NUCLEATION
SURFACE PROPERTIES
REPRINT: ON THE CONTACT ANGLE IN HETEROGENEOUS NUCLEATION UPON A SUBSTRATE.
AD-614 542 DIV. 25

•NUCLEI
ABSORPTION
REPRINT: ABSORPTION OF SIGMA(-) HYPERONS IN PHOTOGRAPHIC EMULSION NUCLEI.
AD-614 213 DIV. 20

MAGNETIC MOMENTS
REPRINT: MAGNETIC DIPOLE MOMENTS OF ODD-MASS NUCLEI IN THE SPHERICAL REGION.
AD-614 496 DIV. 20

NUCLEAR PROPERTIES
REPRINT: SOME POSSIBILITIES FOR UNUSUAL LIGHT HYPERNUCLEI.
AD-614 529 DIV. 20
REPRINT: COSMIC-RAY HEAVY NUCLEI AT THE GEOMAGNETIC EQUATOR.
AD-614 549 DIV. 20

•NUCLEONS
HYPERONS
REPRINT: DYNAMIC MODEL OF THE 1535-MEV XI• HYPERON.
AD-614 176 DIV. 20

NUCLEAR REACTIONS
REPRINT: ANALYSIS OF NUCLEON TRANSFER DATA.
AD-614 089 DIV. 20

•NUCLEOTIDES
METABOLISM
DPN-LINKED CYTOPLASMIC METABOLITES IN THE RAT-LEG MUSCLE, IN SITU, DURING CONTRACTION AND RECOVERY.
AD-614 246 DIV. 16

•NUMERICAL ANALYSIS
FUNCTIONS
REPRINT: GENERALIZED RATIONAL APPROXIMATION.
AD-614 528 DIV. 15

GAME THEORY
ON RANDOM WALKS WITH AN ABSORBING BARRIER AND GAMBLING SYSTEMS.
AD-614 064 DIV. 15

NONEQUILIBRIUM FLOW
TECHNIQUES FOR SOLVING NONEQUILIBRIUM EXPANDING FLOW PROBLEMS.
AD-614 457 DIV. 9

•NUMERICAL METHODS AND PROCEDURES
FLUID MECHANICS
SOME RECENT DEVELOPMENTS IN THE THEORY OF VISCOUS FLUID FLOW WITH TECHNOLOGICAL AND GEOPHYSICAL APPLICATIONS.
AD-614 429 DIV. 9

•NYLON
CORDAGE
DEVELOPMENT AND TESTING OF TAUT-NYLON MOORED INSTRUMENT STATIONS (WITH DETAILS OF DESIGN AND CONSTRUCTION).
AD-614 427 DIV. 2

•N-BODY PROBLEM
CELESTIAL MECHANICS
REPRINT: SOME PERIODIC SOLUTIONS OF A FOUR-BODY PROBLEM.
AD-614 295 DIV. 2

NUCLEAR PARTICLES
REPRINT: PRACTICLE THEORY OF THREE-PARTICLE STATES. I. NONRELATIVISTIC.
AD-614 493 DIV. 20

NUCLEAR SCATTERING
ELECTRON SCATTERING ON NUCLEONS, THREE-BODY NUCLEI, AND CA40.
AD-614 270 DIV. 20

•N-BODY PROBLEM SCATTERING
REPRINT: THREE-PARTICLE UNITARITY INTEGRAL.
AD-614 173 DIV. 25

•N-HETEROCYCLIC COMPOUNDS
SYNTHESIS (CHEMISTRY)
REPRINT: SYNTHESIS OF A SILAZAROPHENANTHRENE, 10,10DIMETHYL-9,10-AZASILADIHY DROPHENANTHRENE.
AD-613 923 DIV. 4
PHOTOCHEMICAL SYNTHESIS OF ANTI-ISONICOTINALDEHYDE OXIME.
AD-614 245 DIV. 16

•OCEAN BOTTOM SAMPLING
WELL LOGGING
REPRINT: A CORE ALIGNER DESIGNED TO RECOVER ORIENTED RECENT MARINE CORES.
AD-614 331 DIV. 2

•OCEAN CURRENTS
THEORY
INERTIAL BOUNDARY CURRENT OF SIMILARITY TYPE IN HOMOGENEOUS AND STRATIFIED OCEANS.
AD-614 097 DIV. 2

•OCEANOGRAPHIC EQUIPMENT
MOORING
DEVELOPMENT AND TESTING OF TAUT-NYLON MOORED INSTRUMENT STATIONS (WITH DETAILS OF DESIGN AND CONSTRUCTION).
AD-614 427 DIV. 2

•OCEANOGRAPHIC VESSELS
SUBMARINES
DEEP SUBMERGENCE RESEARCH. INSPECTION AND TEST OF THE 6,000 FOOT DEEP SUBMERGENCE RESEARCH VESSEL ALVIN.
AD-614 453 DIV. 20

•OCEANOLOGY
FLORIDA STRAIT
MARINE GEOLOGY AND OCEANO GRAPHY OF FLORIDA BAY, APALACHICOLA BAY AND VIC INITY, FLORIDA.
AD-614 437 DIV. 2

NARRAGANSETT BAY
REPRINT: SOME CHARACTE RISTICS OF 25-CPS SHALLOW-WATER AMBIENT NOISE.
AD-614 546 DIV. 2

PACIFIC OCEAN
SEDIMENTS OF WILLAPA SUBMARINE CANYON LOCATED OFF THE WASHINGTON COAST.
AD-614 454 DIV. 2
PHYSICAL, CHEMICAL, AND BIOLOGICAL DATA FROM THE NOR THEAST PACIFIC OCEAN: COLUMBIA RIVER EFFLUENT AREA, JULY-AUGUST 1961.
AD-614 456 DIV. 2

PUGET SOUND
PHYSICAL AND CHEMICAL DATA FOR PUGET SOUND AND APPRO ACHES, SEPTEMBER 1956-DECEMBER 1957.
AD-614 455 DIV. 2

SEAS
COMPUTER PROGRAM FOR FORECASTING THE WIND DRIFT OF SEA ICE.
AD-614 255 DIV. 2

SEDIMENTATION
REPRINT: VARVED MARINE SEDIMENTS IN A STAGNANT FJORD.
AD-614 327 DIV. 2

•OCEANS
THERMAL PROPERTIES
SPACE-TIME VARIABILITY OF THE THERMAL STRUCTURE OF THE UPPER LAYERS OF THE OCEAN.
AD-614 475 DIV. 2

•OFFICER PERSONNEL
SELECTION
DEVELOPMENT OF TEST ITEMS FOR OFFICER SELECTION AND CLASSIFICATION BATTERIES.
AD-614 224 DIV. 23

•OPERATORS (MATHEMATICS)
ALGEBRAS
NOTE ON DERIVATIONS OF OPERATOR ALGEBRAS.
AD-613 926 DIV. 15
DERIVATIONS OF OPERATOR GROUP ALGEBRAS.
AD-613 927 DIV. 15

PROBABILITY
TRANSITION PROBABILITY OPERATORS.
AD-614 436 DIV. 15

•OPHTHALMOLOGY
MEDICAL EQUIPMENT
REPRINT: OPHTHALMOSCOPY OF PIGEONS USING TRANSILLUMINATION.
AD-614 194 DIV. 16

•OPTICAL IMAGES
PATTERN RECOGNITION
RESTORATION OF OPTICAL PATTERNS WHICH HAVE BEEN DISTORTED BY DIFFRACTION AND NOISE.
AD-614 272 DIV. 20

•OPTICAL INSTRUMENTS
STAR TRACKERS
EXPERIMENTAL VERIFICATION OF STAR IDENTIFICATION BY OPTICAL RADIATION ANALYSIS.
AD-614 238 DIV. 19

•OPTICAL PHENOMENA
ATMOSPHERIC REFRACTION
OPTICAL SCINTILLATION IN ATMOSPHERE.
AD-614 056 DIV. 2

•OPTICAL TRACKING
NAVIGATION SATELLITES
PROJECT ANNA (GEODETIC SATELLITE) OPTICAL OBSERVATIONS.

AD-613 938 DIV. 2

•OPTICS
LASER
TUNABLE COHERENT LIGHT SOURCE.
AD-613 968 DIV. 25

•OPTIMIZATION
PROGRAMMING (COMPUTERS)
INVESTIGATION OF THE THEORY OF ALGORITHMS WITH EMPHASIS ON PROGRAM SIMPLIFICATION.
AD-614 287 DIV. 30

•ORGANIC COMPOUNDS
SEMICONDUCTORS
REPRINT: PHOTOGENERATION OF FREE CARRIERS IN ORGANIC CRYSTALS VIA EXCITON-EXCITON INTERACTIONS.
AD-614 385 DIV. 25

•ORGANIC NITROGEN COMPOUNDS
ELASTOMERS
SYNTHESIS OF ELASTOMERS CONTAINING SI-N BONDS IN THE MAIN CHAIN.
AD-614 473 DIV. 4

•ORGANIC OXYGEN COMPOUNDS
MOLECULAR PROPERTIES
REPRINT: LCAO-MO SCF CALCULATIONS OF C606 SYSTEMS.
AD-614 192 DIV. 4

•ORGANIC PHOSPHORUS COMPOUNDS
CHEMICAL REACTIONS
REPRINT: REACTIONS OF ISOPROPYL METHYLPHOSPHONOFL UORIDATE WITH SUBSTITUTED PHENOLS.
AD-614 304 DIV. 4

INSECTICIDES
TRANSLATION OF RUSSIAN RESEARCH: APPROXIMATE ENZYMIC METHOD OF MICROANALYSIS FOR IDENTIFYING RESIDUAL AMOUNTS OF ORGANOPHOSPHORUS INSECTICIDES.
AD-614 396 DIV. 4

SYNTHESIS (CHEMISTRY)
REPRINT: SYNTHESIS OF ETHYL P-NITROPHENYL ALPHA METHOXYALKYL-PHOSPHONATES.
AD-614 350 DIV. 4

•OSCILLATORS
LASERS
REPRINT: CRITERIA FOR OPTICAL MASER AMPLIFIERS AND OSCILLATORS.
AD-614 209 DIV. 25

•OXIDATION
NIOBIUM ALLOYS
TRANSLATION OF RUSSIAN RESEARCH: INVESTIGATING OXIDATIONS OF NIOBIUM-TITANIUM-ZIRCONIUM ALLOYS.
AD-614 017 DIV. 17

ZIRCONIUM
REPRINT: PARABOLIC OXIDATION KINETICS OF BETA-ZIRCONIUM.
AD-614 556 DIV. 17

•OXIMES
SYNTHESIS (CHEMISTRY)
PHOTOCHEMICAL SYNTHESIS OF ANTI-ISONICOTINALDEHYDE OXIME.
AD-614 245 DIV. 16

•OXYGEN
FLUORINE
REPRINT: THE EFFECT OF THE 3.10 MEV STATE OF F17 ON THE O16 (P, GAMMA) REACTION.
AD-614 204 DIV. 20

PHOTOCHEMISTRY
REPRINT: COLLISIONAL DEACTIVATION OF THE EXCITED SINGLET OXYGEN ATOMS AND THEIR INSERTION INTO THE CH BONDS OF PROPANE.
AD-614 502 DIV. 4

SOLID STATE PHYSICS
REPRINT: INFLUENCE OF CONTROLLED ADDITIONS OF OXYGEN ON THE SUPERCONDUCTIVITY OF NIOBIUM.
AD-614 296 DIV. 25

•OXYGEN CONSUMPTION
BLOOD VOLUME
REPRINT: METABOLIC RESPONSES DURING MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG.
AD-614 246 DIV. 16
REPRINT: MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG.
AD-614 247 DIV. 16

•PACIFIC OCEAN
OCEANOLOGY
PHYSICAL, CHEMICAL, AND BIOLOGICAL DATA FROM THE NORTHEAST PACIFIC OCEAN: COLUMBIA RIVER EFFLUENT AREA, JULY-AUGUST 1961.
AD-614 456 DIV. 2

•PALLADIUM ALLOYS
TELLURIUM ALLOYS
REPRINT: CONSTITUTION AND MAGNETIC AND ELECTRICAL PROPERTIES OF PALLADIUM TELLURIDES (PDTE-PDTE2).
AD-614 519 DIV. 17

•PARACHUTE FABRICS
STRESSES
PARACHUTE STRESS ANALYSIS DURING INFLATION AND AT STEADY STATE.
AD-614 138 DIV. 1

•PARACHUTES
STRESSES
PARACHUTE STRESS ANALYSIS DURING INFLATION AND AT STEADY STATE.
AD-614 138 DIV. 1

•PARAMAGNETIC RESONANCE
ELECTROCHEMISTRY
REPRINT: APPLICATION OF ELECTRON PARAMAGNETIC RESONANCE TECHNIQUES IN ELECTROCHEMISTRY.
AD-614 538 DIV. 4

TISSUES (BIOLOGY)
REPRINTS: ELECTRON SPIN RESONANCE CHARACTERISTICS OF SOME NORMAL TISSUES: EFFECT OF MICROWAVE POWER.
AD-614 343 DIV. 16

•PARAMETRIC AMPLIFIERS
CYCLOTRON WAVES
FREQUENCY AND POWER CONVERSION PROPERTIES OF CYCLOTRON WAVES.
AD-614 123 DIV. 8

RADIO RECEIVERS
TUNABLE PRESELECTION THROUGH PARAMETRIC CONVERSION.
AD-614 027 DIV. 8

•PARASITES
PHILIPPINES
REPRINT: A MONOGENETIC AND SEVEN DIGENETIC TREMATODES OF AMPHIBIANS AND REPTILES FROM PALAWAN ISLAND, PHILIPPINES.
AD-614 202 DIV. 16

•PARASITIC DISEASES
TAIWAN
LUNG WORM ANGIOSTRONGYLUS CANTONENSIS OF RODENTS ON TAIWAN (FORMOSA) AND THE OFFSHORE ISLANDS.
AD-614 200 DIV. 16

•PARTIAL DIFFERENTIAL EQUATIONS
FLUID MECHANICS
SOME RECENT DEVELOPMENTS IN THE THEORY OF VISCOUS FLUID FLOW WITH TECHNOLOGICAL AND GEOPHYSICAL APPLICATIONS.
AD-614 429 DIV. 9

•PARTICLE ACCELERATOR TARGETS
POLYETYLENE PLASTICS
REPRINT: EXPERIMENTS ON DYNAMIC POLARIZATION OF PROTONS IN POLYETHYLENE BY THE 'SOLID EFFECT'. A PROPOSED POLARIZED PROTON TARGET.
AD-614 145 DIV. 20

•PARTICLE TRAJECTORIES
ELASTIC SCATTERING
REPRINT: A NOTE ON THE SIGNATURES OF THE DOMINANT REGGE TRAJECTORIES.
AD-614 537 DIV. 20

SIMULATION
TRANSLATION OF RUSSIAN RESEARCH: SIMULATION OF PARTICLE MOTION IN INTERSECTING ELECTRIC AND MAGNETIC FIELDS.
AD-613 980 DIV. 25

•PARTICLES
SCATTERING
REPRINT: ASYMPTOTIC BEHAVIOR FOR LARGE IMAGINARY VALUES OF ANGULAR MOMENTUM OF THE AMPLITUDES FOR THE SCATTERING OF A DIRAC PARTICLE ON A CENTRAL SCALAR POTENTIAL.
AD-614 206 DIV. 25

•PATHOLOGY
NERVOUS SYSTEM
REPRINT: SPONGY DEGENERATION OF THE NERVOUS SYSTEM.
AD-614 337 DIV. 16

•PATTERN RECOGNITION
COMMUNICATION THEORY
RESTORATION OF OPTICAL PATTERNS WHICH HAVE BEEN DISTORTED BY DIFFRACTION AND NOISE.
AD-614 272 DIV. 30

•PEPTIDES
ANTIGENS AND ANTIBODIES
REPRINT: PEPTIDE MAPS OF ANTIBODIES AGAINST AN ANTIGEN CONTAINING TWO DIFFERENT DETERMINANT GROUPS.
AD-614 213 DIV. 16

•PERFORMANCE (HUMAN)
FLIGHT SIMULATORS
EFFECTS OF TASK LOADING ON PILOT PERFORMANCE DURING SIMULATED LOW-ALTITUDE HIGH-SPEED FLIGHT.
AD-614 243 DIV. 28

RELIABILITY
QUANTIFICATION OF HUMAN RELIABILITY. A FEASIBILITY DEMONSTRATION.
AD-614 134 DIV. 28

•PERITONEUM
PERMEABILITY
REPRINT: THAM DIALYSIS: AN EXPERIMENTAL METHOD TO STUDY DIFFUSION OF CERTAIN

WEAK ACIDS IN VIVIO. II. SECOBARBITAL.
AD-614 355 DIV. 16

•PERTURBATION THEORY
LASERS
REPRINT: A QUANTUM MECHANICAL EVALUATION OF LINE BREADTHS INVOLVED IN TUNED-LASER ABSORPTION AND STIMULATED EMISSION SPECTROSCOPY.
AD-614 383 DIV. 25

QUANTUM MECHANICS
REPRINT: THE GENERAL ORTHOGONALITY THEOREM IN THE HYLLERAAS-SCHERR-KNIGHT VARIATIONAL PERTURBATION METHOD.
AD-614 220 DIV. 25

•PETROLOGY
METAMORPHIC ROCK
REPRINT: THE BASALT-ECLOGITE TRANSFORMATION AND CRUSTAL STRUCTURE IN THE WESTERN UNITED STATES.
AD-614 303 DIV. 2

•PHARMACOLOGY
MENTAL DISORDERS
TRANSLATION OF RUSSIAN RESEARCH: INFLUENCE OF CERTAIN PHARMACOLOGICAL PREPARATIONS ON THE BIOELECTRIC ACTIVITY OF THE BRAIN IN SCHIZOPHRENIA.
AD-614 403 DIV. 16

•PHASE DISTORTION
FREQUENCY DIVIDERS
SIGNAL DISTORTION IN A FREQUENCY DIVIDER.
AD-614 425 DIV. 8

•PHASE MEASUREMENT
RADAR SIGNALS
A STATISTICAL ANALYSIS OF PHASE ERRORS AND PHASE DIFFERENCE ERRORS DUE TO THE ATMOSPHERE IN THE OBSERVATIONS OF THE RADAR RETURN FROM A SATELLITE.
AD-614 414 DIV. 6

•PHASE SHIFT
ELECTROMAGNETIC WAVE REFLECTIONS
REPRINT: SIMPLE CONSTRUCTION FOR DETERMINING THE PHASE CHANGE OF LIGHT REFLECTED AT NORMAL INCIDENCE.
AD-614 309 DIV. 25

•PHASE SHIFTERS
HELIXES
HELICAL PHASE SHIFTERS.
AD-614 069 DIV. 8

•PHASE STUDIES
LIQUID METALS
REPRINT: THERMAL CONVECTION DURING HORIZONTAL SOLIDIFICATION OF PURE METALS AND ALLOYS.
AD-614 182 DIV. 17

SILICIDES
REPRINT: POLYMORPHISM OF RARE EARTH DISILICIDES.
AD-614 137 DIV. 25

SOUND TRANSMISSION
TRANSLATION OF RUSSIAN RESEARCH: SPEED OF SOUND IN TWOPHASE MEDIA.
AD-614 018 DIV. 25

•PHASED ARRAYS
POWER AMPLIFIERS
L-BAND POWER AMPLIFIER FOR PHASED ARRAYS.
AD-614 426 DIV. 8

•PHENOLS
CHEMICAL REACTIONS
REPRINT: REACTIONS OF ISOPROPYL METHYLPHOSPHONOFLUORIDATE WITH SUBSTITUTED PHENOLS.
AD-614 304 DIV. 4

PLANTS (BOTANY)
REPRINT: PHENOLIC ACIDS AND LIGNINS IN THE LYCOPODIALES.
AD-614 513 DIV. 4

•PHONONS
SUPERCONDUCTORS
REPRINT: CALCULATION OF THE QUASIPARTICLE RECOMBINATION TIME IN A SUPERCONDUCTOR.
AD-614 367 DIV. 25

•PHOSPHATES
TEETH
REPRINT: PAROTID FLUID FLOW RATE, PAROTID FLUID, AND SERUM INORGANIC PHOSPHATE CONCENTRATIONS AS RELATED TO DENTAL CARIES STATUS IN MAN.
AD-614 334 DIV. 16

•PHOSPHINES
SYNTHESIS (CHEMISTRY)
REPRINT: NEW TRIPHENYL PHOSPHINE HYDRIDES OF RHENIUM (NUOVI IDRURI TRIFENILFOSFINICI DI RENIO).
AD-614 207 DIV. 4

•PHOSPHONIC ACIDS
ESTERS
REPRINT: SYNTHESIS OF ETHYL P-NITROPHENYL ALPHA METHOXYALKYL-PHOSPHONATES.
AD-614 350 DIV. 4

•PHOSPHOPROTEINS
AMINES
REPRINT: N-ACETYL GROUPS IN VITELLENIN.
AD-614 514 DIV. 16

•PHOSPHORESCENCE
CALCIFICATION
REPRINT: PHOSPHORESCENCE OF CALCIFIED TISSUES.
AD-614 210 DIV. 16

HYDROCARBONS
REPRINT: TEMPERATURE DEPENDENCE OF THE LIFETIME OF PHOSPHORESCENCE OF SOME POLYNUCLEAR HYDROCARBONS IN VISCOUS SOLUTIONS.
AD-614 530 DIV. 4

•PHOTOCHEMISTRY
COTTON TEXTILES
REPRINT: EFFECT OF NONCELLULOSIC MATERIALS (COPPER AND NICKEL OXINATES) ON ACTINIC DEGRADATION OF COTTON FABRIC.
AD-614 499 DIV. 14

CYCLOBUTENES
REPRINT: PHOTOCHEMICAL ADDITION OF HYDROGEN BROMIDE TO 2-BUTENE IN THE GAS PHASE.
AD-614 500 DIV. 4

FREE RADICALS
REPRINT: IDENTIFICATION OF FREE RADICALS IN FLASH PHOTOLYSIS.
AD-614 497 DIV. 25

OXIMES
PHOTOCHEMICAL SYNTHESIS OF ANTI-ISONICOTINALDEHYDE OXIME.
AD-614 249 DIV. 16

•PHOTOCONDUCTIVITY
AROMATIC COMPOUNDS
REPRINT: PHOTOCONDUCTIVITY OF ANTHRACENE.
AD-614 197 DIV. 25

•PHOTOELASTICITY
MATERIALS
TRANSLATION OF JAPANESE RESEARCH: SOME NEW FREEZE PHOTOELASTIC MATERIALS AND THEIR APPLICATION.
AD-614 278 DIV. 14

TEST METHODS
TRANSLATION OF FRENCH RESEARCH. PHOTOELASTICITY: PRINCIPLES, METHODS AND APPLICATIONS TO MATERIALS TESTING, METALLURGY AND MECHANICS, PARTS I, II, III.
AD-614 282 DIV. 30

•PHOTOELECTRIC EFFECT
BARIUM COMPOUNDS
PHOTOELECTRIC EMISSION FROM BARIUM OXIDE.
AD-614 326 DIV. 25

•PHOTOELECTRIC MATERIALS
FIELD THEORY
ELECTRO-OPTICAL METHOD FOR INVESTIGATION OF FIELD AND CURRENT DISTRIBUTIONS IN SEMICONDUCTORS AND LAYER-LIKE FIELD DISTRIBUTIONS IN PHOTOCONDUCTORS.
AD-614 439 DIV. 25

•PHOTOGRAMMETRY
CORRELATION TECHNIQUES
TRANSLATION OF RUSSIAN RESEARCH: THE PHOTOGRAMMETRIC PARAMETERS OF THE CAMERA OF A PHOTOGRAPHIC APPARATUS.
AD-614 105 DIV. 2

PHOTOGRAPHIC IMAGES
TRANSLATION OF EAST GERMAN RESEARCH: COMMENTS ON THE EFFECT OF A DEFORMED, PLANE PARALLEL GLASS PLATE IN THE IMAGE PLANE OF AN OBJECTIVE ON ITS DISTORTION.
AD-614 401 DIV. 2

STEREOSCOPES
TRANSLATION OF RUSSIAN RESEARCH: THE USD-1 DROBYSHEV UNIVERSAL STEREOGRAPH.
AD-614 107 DIV. 2

•PHOTOGRAPHIC EMULSION
NUCLEI
REPRINT: ABSORPTION OF SIGMA(-) HYPERONS IN PHOTOGRAPHIC EMULSION NUCLEI.
AD-614 213 DIV. 20

•PHOTOGRAPHIC EQUIPMENT
PHOTOGRAMMETRY
TRANSLATION OF RUSSIAN RESEARCH: THE PHOTOGRAMMETRIC PARAMETERS OF THE CAMERA OF A PHOTOGRAPHIC APPARATUS.
AD-614 105 DIV. 2

•PHOTOGRAPHIC IMAGES
DEFORMATION
TRANSLATION OF EAST GERMAN RESEARCH: COMMENTS ON THE EFFECT OF A DEFORMED, PLANE PARALLEL GLASS PLATE IN THE IMAGE PLANE OF AN OBJECTIVE ON ITS DISTORTION.
AD-614 401 DIV. 2

•PHOTOGRAPHIC INTELLIGENCE
DATA PROCESSING SYSTEMS
DEVELOPMENT OF AN ELECTRONIC DATA PROCESSING MODULE FOR MOBILE WING RECONNAISSANCE

TECHNICAL SQUADRON.
AD-619 239 DIV. 18

•PHOTON BOMBARDMENT
DEUTERONS
PHOTODISINTEGRATION OF THE DEUTERON BY POLARIZED PHOTONS.
AD-619 276 DIV. 20

•PHOTONS
FIELD THEORY
REPRINT: ON MASSIVE AND MASSLESS PHOTONS.
AD-619 184 DIV. 25

•PHOTOSYNTHESIS
UNDERGROUND STRUCTURES
TRANSLATION OF RUSSIAN RESEARCH ON PHOTOSYNTHESIS THAT OCCURS UNDERGROUND.
AD-619 024 DIV. 16

•PHYSICS
SCIENTIFIC RESEARCH
TECHNICCAL PROGRESS ON FUNDAMENTAL AND APPLIED RESEARCH PROGRAMS.
AD-619 042 DIV. 30

THEORY
REPRINT: DISCUSSION OF THE WEAK AND STRONG PRINCIPLES OF EQUIVALENCE.
AD-619 168 DIV. 25

•PHYSIOLOGY
MENTAL DISORDERS
REPRINT: PHYSIOLOGICAL CORRELATES OF MENTAL DISEASE.
AD-619 148 DIV. 16

•PIERS
NAVAL SHORE ESTABLISHMENTS
STUDY OF EFFECTIVE FENDER SYSTEMS FOR NAVY PIERS AND WHARVES.
AD-613 940 DIV. 13

•PIEZOELECTRIC TRANSDUCERS
PRESSURE
CALIBRATION OF A PRESSURE SENSOR FOR MEASUREMENTS IN CONTINUUM AND RARFFIED GAS FLOWS.
AD-619 424 DIV. 30

•PIGEONS
OPHTHALMOLOGY
REPRINT: OPHTHALMOSCOPY OF PIGEONS USING TRANSILLUMINATION.
AD-619 194 DIV. 16

•PILOTS
PERFORMANCE TESTS
EFFECTS OF TASK LOADING ON PILOT PERFORMANCE DUNING SIMULATED LOW-ALTITUDE HIGH-SPEED FLIGHT.
AD-619 249 DIV. 28

STRESS (PHYSIOLOGY)
REPRINT: FLYING STRESS IN RELATION TO FLYING PROFICIENCY.
AD-619 332 DIV. 16

•PIONS
BARYONS
REPRINT: ISOBAR MECHANISM AND RESONANCE POLES FOR PION- BARYON SYSTEMS.
AD-619 143 DIV. 20

NUCLEAR SCATTERING
REPRINT: SCATTERING OF PIONS BY LIGHT NUCLEI.
AD-619 087 DIV. 20

•PIPES
CORROSION
PIPE CORROSION AT NAVAL ACTIVITIES.
AD-619 259 DIV. 13

•PITUITARY HORMONES
VASOACTIVE AGENTS
SMOOTH MUSCLE RESPONSES AS ALTERED BY HUMORAL BACK GROUND.
AD-619 478 DIV. 16

•PLANTS (BOTANY)
ARCTIC REGIONS
ROLE OF PHYSIOLOGY AND ENVIRONMENT IN THE DISTRIBUTION OF ARCTIC PLANTS.
AD-619 079 DIV. 2

GLYCOSIDES
REPRINT: BIOSYNTHESIS OF MUSTARD OIL GLUCOSIDES: V. FORMATION OF GLUCONASTURTIIN FROM L-GAMMA-PHENYLBUTYRINE C(14)-N(15) IN WATERCRESS.
AD-619 508 DIV. 16
REPRINT: BIOSYNTHESIS OF MUSTARD OIL GLUCOSIDES. VI. BIOSYNTHESIS OF GLUCOBARBARIN IN RESEDA LUTEOLA L.
AD-619 512 DIV. 16

PHENOLS
REPRINT: PHENOLIC ACIDS AND LIGNINS IN THE LYCOP ODIALES.
AD-619 513 DIV. 4

•PLASMA
POTASSIUM
REPRINT: STUDIES ON THE ROLE OF POTASSIUM IONS IN THE LETHAL TOXICITY OF STREPTOLYSIN O.
AD-619 198 DIV. 16

•PLASMA MEDIUM
ELECTROMAGNETIC WAVES
ELECTROMAGNETIC WAVE PROPAGATION IN ANISOTROPIC PLASMAS ALONG THE DIRECTION OF A STATIC MAGNETIC FIELD.
AD-619 442 DIV. 25

ELECTRON BEAMS
REPRINT: GENERATION OF A HOT, DENSE PLASMA BY A COLLECTIVE BEAM-PLASMA INTER ACTION.
AD-619 384 DIV. 25

MAGNETIC PROPERTIES
REPRINT: HIGH-FIELD MAGNETORESISTANCE OF INHOMOGENEOUS SEMICONDUCTORS AND PLASMAS. TWO-DIMENSIONAL INHOMOGENEITY DISTRIBUTIONS.
AD-619 163 DIV. 25

MICROWAVE AMPLIFIERS
STUDY OF PLASMA AMPLIFIERS: USE OF RECOMBINATION RADIATION AT OPTICAL FREQUENCIES; OPTICAL RESONATOR MODES IN BROMINE-ARGON LASERS.
AD-619 253 DIV. 8

•PLASMA OSCILLATIONS
ENERGY CONVERSION
PLASMA KINETIC ENERGY -RF CONVERSION.
AD-619 285 DIV. 8

•PLASMA PHYSICS
ELECTROSTATICS
ADIABATIC LINEAR STARK EFFECT IN A PLASMA.
AD-619 283 DIV. 25

MAGNETOHYDRODYNAMICS
INTERPRETATION OF MAGNETO GASDYNAMIC FLOW PATTERNS.
AD-619 050 DIV. 25
APPLICATION OF VARIATIONAL METHODS FOR THE SOLUTION OF GASDYNAMIC AND MAGNETOGASDYNAMIC PROBLEMS.
AD-619 051 DIV. 25
PRACTICAL EXAMPLES OF ONE DIMENSIONAL UNSTEADY POTENTIAL FLOWS IN MAGNETOGASDYNAMIC PROBLEMS.
AD-619 052 DIV. 25

SHOCK WAVES
SHOCK WAVES.
AD-619 053 DIV. 25

•PLASMA SHEATH
WAVE TRANSMISSION
AERODYNAMIC METHODS OF PRODUCING ANTENNA WINDOWS IN A PLASMA SHEATH.
AD-619 084 DIV. 8

•PLASTICS
MAPPING
TRANSLATION OF RUSSIAN RESEARCH: USE OF TRANSPARENT PLASTICS IN STEREOTOPOGRAPHIC WORK.
AD-619 106 DIV. 2

•PLATINUM
ADSORPTION
BASIC STUDY OF GAS-SOLID INTERACTIONS: 1. INTERACTION OF HYDROGEN WITH PLATINIZED CARBON.
AD-619 041 DIV. 4

•PLATYHELMINTHS
MORPHOLOGY (BIOLOGY)
REPRINT: A MONOGENETIC AND SEVEN DIGENETIC TREMATODES OF AMPHIBIANS AND REPTILES FROM PALAWAN ISLAND, PHI LIPPINES.
AD-619 302 DIV. 16

•POLAROGRAPHIC ANALYSIS
INSTRUMENTATION
REPRINT: OPERATIONAL AMPLIFIER CIRCUITS FOR CONTROLLED POTENTIAL CYCLIC VOLTAMMETRY, II.
AD-619 195 DIV. 4

SULFURIC ACID
REPRINT: HIGHLY ACID-SUPPORTING ELECTROLYTES IN POLAROGRAPHY: CHANGES IN POLAROGRAPHIC WAVES OF SELENIUM (IV) UPON STANDING.
AD-619 382 DIV. 4

•POLYATOMIC MOLECULES
SPECTRA (INFRARED)
REPRINT: ANHARMONICITY CORRECTION FOR POLYATOMIC MOLECULES. METHODS AND APPLICATION TO FORMALDEHYDE.
AD-619 177 DIV. 25

•POLYCYCLIC COMPOUNDS
DIFFUSION
REPRINT: DIFFUSION IN ORGANIC CRYSTALS. SELF-DIFFUSION IN ANTHRACENE.
AD-619 531 DIV. 25

SYNTHESIS (CHEMISTRY)
REPRINT: SYNTHESIS OF A SILAZAROPHENANTHRENE, 10,10DIMETHYL-9,10-AZASILADIHY DROPHENANTHRENE.
AD-613 923 DIV. 4

•POLYESTER PLASTICS
PHOTOELASTICITY
TRANSLATION OF JAPANESE RESEARCH: SOME NEW FREEZE PHOTOELASTIC MATERIALS AND THEIR APPLICATION.
AD-619 278 DIV. 14

•POLYETHYLENE PLASTICS

PARTICLE ACCELERATOR TARGETS
REPRINT: EXPERIMENTS ON DYNAMIC POLARIZATION OF PROTONS IN POLYETHYLENE BY THE 'SOLID EFFECT'. A PROPOSED POLARIZED PROTON TARGET.
AD-614 145 DIV. 20

•POLYMERIZATION
REACTION KINETICS
STATIONARY STATE CRITERION FOR FREE RADICAL POLYMERIZATION FOR LINEARLY INCREASING REACTION TEMPERATURE.
AD-614 077 DIV. 4
REPRINT: ANIONIC POLYMERIZATION OF BUTADIENE AND STYRENE.
AD-614 498 DIV. 4

•POTASSIUM
PLASMA
REPRINT: STUDIES ON THE ROLE OF POTASSIUM IONS IN THE LETHAL TOXICITY OF STREPTOLYSIN O.
AD-614 198 DIV. 16

SPECIFIC HEAT
SPECIFIC HEATS BELOW 320K OF POTASSIUM, RUBIDIUM AND CAESIUM.
AD-614 520 DIV. 25

•POTASSIUM COMPOUNDS
CHLORIDES
REPRINT: THERMODYNAMIC PROPERTIES OF AQUEOUS SOLUTIONS OF MIXED ELECTROLYTES. THE HYDROCHLORIC ACID-POTASSIUM CHLORIDE SYSTEM FROM 40 TO 0C.
AD-614 555 DIV. 4

•POTENTIAL THEORY
ALGEBRAIC TOPOLOGY
REPRINT: HARMONIC FUNCTIONS WITH GIVEN VALUES AND MINIMUM NORMS IN RIEMANNIAN SPACES.
AD-614 543 DIV. 15

SCATTERING
REPRINT: ASYMPTOTIC BEHAVIOR FOR LARGE IMAGINARY VALUES OF ANGULAR MOMENTUM OF THE AMPLITUDES FOR THE SCATTERING OF A DIRAC PARTICLE ON A CENTRAL SCALAR POTENTIAL.
AD-614 206 DIV. 25

•POWDER METALLURGY
BERYLLIUM
BERYLLIUM RESEARCH AND DEVELOPMENT PROGRAM. VOLUME VI. INFLUENCE OF THE DISTRIBUTION OF OXIDE AND THE TOTAL IMPURITY LEVEL ON RECRYSTALLIZATION AND GRAIN GROWTH OF BERYLLIUM.
AD-613 952 DIV. 17

•POWER AMPLIFIERS
CYCLOTRON WAVES
FREQUENCY AND POWER CONVERSION PROPERTIES OF CYCLOTRON WAVES.
AD-614 123 DIV. 8

L BAND
L-BAND POWER AMPLIFIER FOR PHASED ARRAYS.
AD-614 426 DIV. 8

•POWER SUPPLIES
DESIGN
DESIGN OF A HIGH-ENERGY FAST-PULSE POWER SYSTEM FOR SIMULATING HIGH-ALTITUDE NUCLEAR DETONATIONS.
AD-613 959 DIV. 7

PRIMARY CELLS
THIN-PLATE BATTERY. SUPPLEMENT TO THIN-FILM MONOTRONICS.
AD-614 471 DIV. 7

•PRESSURE
MEASUREMENT
CALIBRATION OF A PRESSURE SENSOR FOR MEASUREMENTS IN CONTINUUM AND RAREFIED GAS FLOWS.
AD-614 424 DIV. 20

•PROBABILITY
DECISION MAKING
HUMAN PROCESSING OF EQUIVOCAL INFORMATION.
AD-613 949 DIV. 28

INTEGRALS
THE LEBESGUE-STIELJES INTEGRAL AS APPLIED IN PROBABILITY DISTRIBUTION THEORY.
AD-614 256 DIV. 15

OPERATORS (MATHEMATICS)
TRANSITION PROBABILITY OPERATORS.
AD-614 436 DIV. 15

TABLES
RANK ORDER PROBABILITIES: TWO-SAMPLE NORMAL SHIFT ALTERNATIVES.
AD-614 131 DIV. 15

•PROCESSING
CERAMIC MATERIALS
FABRICATION AND FRACTURE OF POLYCRYSTALLINE NIO.
AD-614 263 DIV. 14

•PROCUREMENT
REPORTS
WRITING AND SUBMITTING THE SUCCESSFUL PROPOSAL. A SELECTIVE ANNOTATED BIBLIOGRAPHY.
AD-614 269 DIV. 26

•PROGRAMMING LANGUAGES
SCIENTIFIC RESEARCH
SOME REFLECTIONS ON A SURVEY OF RESEARCH PROBLEMS IN COMPUTER SOFTWARE.
AD-614 417 DIV. 20

•PROGRAMMING (COMPUTERS)
AIR MASS ANALYSIS
TRANSLATION OF RUSSIAN RESEARCH: FORMULATION OF TRAJECTORIES OF AIR PARTICLES WITH THE AID OF ELECTRONIC COMPUTERS.
AD-614 021 DIV. 2

INTEGRATORS
TRANSLATION OF RUSSIAN PATENT ON SELF-ADJUSTING SYSTEM FOR PROGRAMMED CONTROL OF METAL-CUTTING MACHINE TOOLS.
AD-614 022 DIV. 20

LANGUAGE
PLACEBO IV. RULES, CONCORDANCE, SAMPLE COMPUTER GENERATION.
AD-614 257 DIV. 20
PREREQUISITE TO THE UTILITY OF MICROGRAMMARS.
AD-614 258 DIV. 20

NUCLEAR REACTORS
COMPUTER CODES FOR REACTOR AND HAZARD ANALYSIS AT THE NUCLEAR AEROSPACE RESEARCH FACILITY.
AD-613 983 DIV. 20

OCEANOLOGY
COMPUTER PROGRAM FOR FORECASTING THE WIND DRIFT OF SEA ICE.
AD-614 255 DIV. 2

PREPARATION
PROGRAMMING BY QUESTIONNAIRE.
AD-613 976 DIV. 20

TEST EQUIPMENT (ELECTRONICS)
COMPUTER ALGORITHM FOR FAULT ISOLATION AND TEST POINT SELECTION.
AD-613 960 DIV. 8

THEORY
INVESTIGATION OF THE THEORY OF ALGORITHMS WITH EMPHASIS ON PROGRAM SIMPLIFICATION.
AD-614 287 DIV. 20

•PROJECTILES
STRESSES
STRESS WAVES IN BOUNDED MEDIA RESULTING PRIMARILY FROM EXPLOSIONS AND/OR PROJECTILE IMPACT.
AD-613 935 DIV. 22

•PROJECTIVE GEOMETRY
MECHANICS
THE GENERALIZATION OF HAMILTON'S MECHANICS. I. THEORY OF HOMOGENEOUS CONTACT TRANSFORMATIONS.
AD-614 029 DIV. 25

VISUAL PERCEPTION
REPRINT: DESARGUESIAN PROPERTY IN VISUAL SPACE.
AD-614 364 DIV. 28

•PROPELLANTS
THERMAL DIFFUSION
METHOD OF MEASURING THERMAL DIFFUSIVITY OF POORLY CONDUCTIVE MATERIALS WITH SPECIAL REFERENCE TO AMMONIUM PERCHLORATE.
AD-614 081 DIV. 25

•PROTECTIVE CLOTHING
SURVIVAL
REVIEW OF CURRENT CONCEPTS AND PRACTICES USED TO CONTROL BODY HEAT LOSS DURING WATER IMMERSION.
AD-614 241 DIV. 16

•PROTEINS
ELECTRICAL CONDUCTANCE
ELECTRICAL CONDUCTIVITY OF PROTEINS IN THE SOLID STATE.
AD-614 440 DIV. 16

MOLECULAR STRUCTURE
REPRINT: REDUCTION AND RE-OXIDATION OF THE DISULPHIDE BONDS OF SOY BEAN TRYPSIN INHIBITOR.
AD-614 193 DIV. 16

TOXICITY
REPRINT: STUDIES ON THE ROLE OF POTASSIUM IONS IN THE LETHAL TOXICITY OF STREPTOLYSIN O.
AD-614 198 DIV. 16

VOLUMETRIC ANALYSIS
REPRINT: COULOMETRIC DETERMINATION OF PROTEIN NITROGEN.
AD-614 341 DIV. 16

•PROTON CAPTURE
NEUTRON CAPTURE
REPRINT: MESON EFFECTS IN N-P CAPTURE.
AD-614 151 DIV. 20

•PROTONS
POLARIZATION
REPRINT: EXPERIMENTS ON DYNAMIC POLARIZATION OF PROTONS IN POLYETHYLENE BY THE 'SOLID EFFECT'. A PROPOSED POLARIZED PROTON TARGET.
AD-614 145 DIV. 20

•PSYCHOMETRICS
STANDARDIZATION
RESTANDARDIZATION OF THE ARMED FORCES WOMEN'S SELECTION TEST, AFWST 5 AND 6.
AD-619 400 DIV. 23

•PSYCHOTROPIC AGENTS
ELECTROENCEPHALOGRAPHY
TRANSLATION OF RUSSIAN RESEARCH: INFLUENCE OF CERTAIN PHARMACOLOGICAL PREPARATIONS ON THE BIOELECTRIC ACTIVITY OF THE BRAIN IN SCHIZOPHRENIA.
AD-619 903 DIV. 16

•PUBLIC OPINION
CIVIL DEFENSE SYSTEMS
THREAT PERCEPTION AND CIVIL DEFENSE.
AD-619 386 DIV. 18

•PUGET SOUND
OCEANOLOGY
PHYSICAL AND CHEMICAL DATA FOR PUGET SOUND AND APPROACHES, SEPTEMBER 1956-DECEMBER 1957.
AD-619 458 DIV. 2

•PULSE MODULATION
CONTROL SYSTEMS
REPRINT: STABILITY CRITERION FOR PULSE-WIDTH-MODULATED FEEDBACK CONTROL SYSTEMS.
AD-619 489 DIV. 30

•PUMPING (ELECTRONICS)
FERRITES
STUDY OF PARALLEL PUMPING IN MICROWAVE FERRITES.
AD-619 048 DIV. 8

MICROWAVE SPECTROSCOPY
REPRINT: OPTICAL DETECTION OF MICROWAVE TRANSITIONS BETWEEN EXCITED ELECTRONIC STATES OF CN AND THE IDENTIFICATION OF THE TRANSITIONS INVOLVED.
AD-619 553 DIV. 25

•PYROLYSIS
REACTION KINETICS
REPRINT: PYROLYSIS STUDIES. STERIC INHIBITION OF RESONANCE IN THE VAPOR PHASE.
AD-613 921 DIV. 4

•QUALITY CONTROL
BONDED JOINTS
REPRINT: TRANSLATION OF CANADIAN RESEARCH. ULTRASONIC METHOD FOR EVALUATING BONDS IN LARGE METALLIC BEARINGS.
AD-619 307 DIV. 26

•QUANTUM MECHANICS
ABSORPTION SPECTRUM
REPRINT: A QUANTUM MECHANICAL EVALUATION OF LINE BREADTHS INVOLVED IN TUNED-LASER ABSORPTION AND STIMULATED EMISSION SPECTROSCOPY.
AD-619 383 DIV. 25

ASTROPHYSICS
TABLE OF HARTREE-FOCK SELF CONSISTENT FIELD WAVE FUNCTIONS WITH EXCHANGE.
AD-619 428 DIV. 2

RADIOFREQUENCY OSCILLATORS
MILLIMETER WAVE GENERATION BY MULTIPLE QUANTUM CONVERSION.
AD-619 092 DIV. 8

RELAXATION TIME
REPRINT: DETERMINATION OF ELECTRON RELAXATION TIME FROM THE GIANT QUANTUM OSCILLATIONS IN THE ACOUSTIC ABSORPTION OF METALS.
AD-619 527 DIV. 25

SPIN
REPRINT: ON THE CONCEPTION OF GENERALIZED SPIN OF FREE DIRAC PARTICLES.
AD-619 219 DIV. 25

•QUARTZ
RESONATORS
PEN FOR FILTER, QUARTZ CRYSTAL, 112 MC, TYPE EL-FR (X-2) AND CRYSTAL UNIT, FILTER, QUARTZ TYPES CR-(XM-64)/U AND CR-(XM-65)/U.
AD-619 223 DIV. 8

•QUARTZ RESONATORS
TEMPERATURE CONTROL
HIGH PRECISION 5 MC QUARTZ RESONATORS FOR TEMPERATURE CONTROL BETWEEN 20 AND 30 C.
AD-619 433 DIV. 8
HIGH PRECISION 5 MC QUARTZ RESONATORS FOR TEMPERATURE CONTROL BETWEEN 20 AND 30 C.
AD-619 434 DIV. 8

•QUINOLINES
FUNGICIDES
REPRINT: EFFECT OF NONCELLULOSIC MATERIALS (COPPER AND NICKEL OXINATES) ON ACTINIC DEGRADATION OF COTTON FABRIC.
AD-619 499 DIV. 14

•RADAR
REPORTS
TRANSLATION OF RUSSIAN RESEARCH: RADIO AND RADAR TECHNOLOGY.
AD-613 964 DIV. 5

•RADAR EQUIPMENT
PERFORMANCE (ENGINEERING)
ERROR ANALYSIS OF RADAR SET AN/MPN-13.
AD-619 048 DIV. 6

•RADAR REFLECTIONS
CORRELATION TECHNIQUES
MEASUREMENT OF PROPERTIES OF SPREAD CHANNELS BY THE TWOFREQUENCY METHOD WITH APPLICATION TO RADAR ASTRONOMY.
AD-619 233 DIV. 2

•RADAR SCANNING
EFFECTIVENESS
EFFICIENCY FUNCTION FOR RATING MECHANICAL SCAN-TRACK RADARS.
AD-619 477 DIV. 6

•RADAR SIGNALS
ATMOSPHERIC REFRACTION
A STATISTICAL ANALYSIS OF PHASE ERRORS AND PHASE DIFFERENCE ERRORS DUE TO THE ATMOSPHERE IN THE OBSERVATIONS OF THE RADAR RETURN FROM A SATELLITE.
AD-619 414 DIV. 6

•RADAR TRACKING
EFFECTIVENESS
EFFICIENCY FUNCTION FOR RATING MECHANICAL SCAN-TRACK RADARS.
AD-619 477 DIV. 6

•RADIATION DAMAGE
INDEXES
RADIATION EFFECTS INFORMATION CENTER, MONTHLY ACCESSION LIST. COORDINATE INDEX, PART II, FOR ACCESSION LISTS FROM OCTOBER 1, 1964 TO MARCH 31, 1965.
AD-619 406 DIV. 32

TRANSISTORS
FIRST TEST ON RADIATION EXPERIMENTATION FOR THE Q-FACTOR TECHNIQUE: BIPOLAR TRANSISTOR GAIN AS A FUNCTION OF NEUTRON EXPOSURE.
AD-619 112 DIV. 8
EVALUATION OF FIELD-EFFECT TRANSISTORS.
AD-619 268 DIV. 8

•RADIATION HAZARDS
IRRADIATED FOODS
INDUCED RADIOACTIVITY IN FOOD AND ELECTRON STERILIZATION.
AD-613 950 DIV. 29

PROGRAMMING (COMPUTERS)
COMPUTER CODES FOR REACTOR AND HAZARD ANALYSIS AT THE NUCLEAR AEROSPACE RESEARCH FACILITY.
AD-613 983 DIV. 30

SPACE FLIGHT
INFLUENCE OF SHIELD GEOMETRY ON AIR DOSE AND TISSUE DOSE FROM PROTONS WITHIN A SPACE VEHICLE.
AD-613 993 DIV. 20

•RADIATION MEASUREMENT SYSTEMS
NUCLEAR RADIATION
TECHNIQUES FOR MEASURING EFFECTS OF NUCLEAR RADIATION ON MATERIALS AND COMPONENTS.
AD-619 109 DIV. 16

RADON
DETERMINATION OF RADON CONCENTRATION IN THE AIR THROUGH MEASUREMENT OF ITS SOLID DECAY PRODUCTS.
AD-613 943 DIV. 20

SOLID STATE PHYSICS
SOLID STATE NUCLEAR DETECTOR.
AD-619 432 DIV. 20

•RADIO ASTRONOMY
ATMOSPHERIC REFRACTION
REPRINT: IONOSPHERIC AND TROPOSPHERIC SCINTILLATIONS OF A RADIO STAR AT ZERO TO FIVE DEGREES OF ELEVATION.
AD-619 161 DIV. 2

ELECTROMAGNETIC WAVE REFLECTIONS
MEASUREMENT OF PROPERTIES OF SPREAD CHANNELS BY THE TWOFREQUENCY METHOD WITH APPLICATION TO RADAR ASTRONOMY.
AD-619 233 DIV. 2

RELATIVITY THEORY
EFFECTS OF GENERAL RELATIVITY ON INTERPLANETARY TIMEDELAY MEASUREMENTS.
AD-619 232 DIV. 25

SOLAR ATMOSPHERE
TRANSLATION OF RUSSIAN RESEARCH: USE OF RADIO DATA TO DETERMINE THE POSITION OF THE REGION IN WHICH THE CHARACTERISTICS OF THE SOLAR ATMOSPHERE CHANGE RAPIDLY.
AD-613 981 DIV. 2

•RADIO COMMUNICATION SYSTEMS
PROPAGATION
RADIO PROPAGATION IN TROPOSPHERIC TRADEWIND DUCTING.
AD-619 240 DIV. 8

REPORTS
TRANSLATION OF RUSSIAN RESEARCH: RADIO AND RADAR TECHNOLOGY.
AD-613 964 DIV. 5

•RADIO EQUIPMENT
MICROMINIATURIZATION (ELECTRONICS)
SMALL SIGNAL SEMICONDUCTOR COMPOSITS: INTEGRATED IF AMPLIFIER, LIMITER, SQUELCH, AND AUDIO CIRCUITS FOR MANPACK RADIO EQUIPMENT.
AD-614 090 DIV. 8

•RADIO RECEIVERS
PARAMETRIC AMPLIFIERS
TUNABLE PRESELECTION THROUGH PARAMETRIC CONVERSION.
AD-614 027 DIV. 8

•RADIO SIGNALS
ATTENUATION
AERODYNAMIC METHODS OF PRODUCING ANTENNA WINDOWS IN A PLASMA SHEATH.
AD-614 084 DIV. 8

PROPAGATION
RADIO PROPAGATION IN TROPOSPHERIC TRADEWIND DUCTING.
AD-614 240 DIV. 8

•RADIO TRANSMISSION
VERY LOW FREQUENCY
VERY LOW FREQUENCY PROPAGATION; ELECTRON AND SOLID STATE PHYSICS; AUTOMATIC CONTROL; COMMUNICATIONS AND NETWORKS; ELECTROMAGNETIC RADIATION.
AD-614 130 DIV. 30

•RADIO WAVES
TERRESTRIAL MAGNETISM
RESULTS OF SIMULTANEOUS ELF MEASUREMENTS AT BRANNENBURG, GERMANY AND KINGSTON, R. I.
AD-614 012 DIV. 2

•RADIOACTIVE ISOTOPES
GASTROINTESTINAL SYSTEM
REPRINT: INFLUENCE OF THE GASTROINTESTINAL IODIDE CYCLE ON THE EARLY DISTRIBUTION OF RADIOACTIVE IODIDE IN MAN.
AD-614 185 DIV. 16

•RADIOACTIVITY
ATMOSPHERE
DETERMINATION OF RADON CONCENTRATION IN THE AIR THROUGH MEASUREMENT OF ITS SOLID DECAY PRODUCTS.
AD-613 943 DIV. 20

•RADIOFREQUENCY GENERATORS
MICROWAVE EQUIPMENT
MICROWAVE SOLID-STATE GENERATORS.
AD-614 047 DIV. 8

•RADIOFREQUENCY POWER
PLASMA PHYSICS
PLASMA KINETIC ENERGY -RF CONVERSION.
AD-614 289 DIV. 8

•RADIOFREQUENCY SPECTROSCOPY
MILLIMETER WAVES
QUANTUM AND SOLID STATE ELECTRONICS.
AD-614 007 DIV. 25

•RADIOGRAPHY
DEFICIENCY DISEASES
IMPORTANCE AND RELIABILITY OF THE ROENTGENOGRAPHIC EXAMINATION OF THE SMALL BOWEL IN PATIENTS WITH TROPICAL SPRUE.
AD-613 918 DIV. 16

•RADIOSONDES
CALIBRATION
TRANSLATION OF RUSSIAN RESEARCH: CALIBRATION OF RADIOSONDES AT TEMPERATURES TO MINUS 100 DEGREES C.
AD-613 979 DIV. 2

•RADON
AIR POLLUTION
DETERMINATION OF RADON CONCENTRATION IN THE AIR THROUGH MEASUREMENT OF ITS SOLID DECAY PRODUCTS.
AD-613 943 DIV. 20

•RARE EARTH COMPOUNDS
SINGLE CRYSTALS
GROWTH AND CHARACTERIZATION OF SINGLE CRYSTALS OF RARE EARTH COMPOUNDS.
AD-614 435 DIV. 25

•RARE EARTH ELEMENTS
ALLOYS
INVESTIGATIONS OF THE SYSTEMS Y-MN, GD-MN AND SM-MN.
AD-614 462 DIV. 17
COMPOUNDS DYMN2, HOMN2 AND ERMN2. CALCULATION OF THE ENERGY AND FREE ENTHALPY OF FORMATION OF RE-MERCURYCOMPOUNDS BY VAPOUR PRESSURE MEASUREMENTS AND THERMAL ANALYSIS.
AD-614 463 DIV. 25
SINTER PROCESS, USING MERCURY AS AN 'AUXILIARY COMPONENT' AS APPLIED TO RE-MN SYSTEMS. DIFFERENTIAL-THERMALAND MAGNETO-THERMAL-ANALYSIS OF THE SYSTEM GD-MN (0 -50% W.% MN).
AD-614 464 DIV. 17
THEORIES OF THE DIFFERENTIAL-THERMAL-RESP. MAGNETOTHERMAL-ANALYSIS. A DETAILED DESCRIPTION OF THE TWO APPARATUS AND OF FURTHER MEASUREMENTS ON RE-MN-ALLOYS.
AD-614 465 DIV. 17

INTERMETALLIC COMPOUNDS
X-RAY-, DTA-, AND THERMOMAGNETIC ANALYSIS OF MANGANESE INTERMETALLIC COMPOUNDS.
AD-614 466 DIV. 17

•REACTOR COOLANTS
HEAT TRANSFER
THERMAL RESPONSE OF AEROSPACE SHIELD TEST REACTOR TO LOSS OF COOLANT.
AD-614 452 DIV. 20

•REACTOR CORES
BOILING
RESPONSE OF REACTOR INSTRUMENTATION TO IN-CORE VOID FORMATIONS SIMULATING BOILING.
AD-614 037 DIV. 20

•REACTOR HAZARDS
BOILING WATER REACTORS
RESPONSE OF REACTOR INSTRUMENTATION TO IN-CORE VOID FORMATIONS SIMULATING BOILING.
AD-614 037 DIV. 20

•READING
TRAINING DEVICES
REPRINT: TYPOGRAPHICAL CUING IN CONVENTIONAL AND PROGRAMED TEXTS.
AD-614 317 DIV. 23

•RECOMBINATION REACTIONS
IONOSPHERE
REPRINT: ELECTRON-ION RECOMBINATION IN NITROGEN.
AD-614 160 DIV. 2

•RECRYSTALLIZATION
HEAT TREATMENT
INFLUENCE OF A FINELY DISPERSED SECOND PHASE ON RECRYSTALLIZATION, ANNEALING BEHAVIOR OF INTERNALLY OXIDIZED ALLOYS OF SILVER CONTAINING MAGNESIUM AND COPPER CONTAINING ALUMIUM.
AD-613 971 DIV. 17

STEEL
REPRINT: RECRYSTALLIZATION KINETICS OF MARTENSITIC EXTRA LOW CARBON STEELS.
AD-614 501 DIV. 17

•RECTIFIERS
SILICON
PRODUCTION ENGINEERING MEASURE. HIGH VOLTAGE SILICON RECTIFIER STACKS.
AD-614 446 DIV. 8

•REELS
ELECTRIC CABLES
SHIPBOARD CABLE-HAULING SYSTEM FOR LARGE ELECTRICAL CABLES.
AD-614 071 DIV. 31

•REENTRY VEHICLES
PLASMA SHEATH
AERODYNAMIC METHODS OF PRODUCING ANTENNA WINDOWS IN A PLASMA SHEATH.
AD-614 084 DIV. 8

•REFLECTION
SHOCK WAVES
REPRINT: END-WALL HEAT-TRANSFER EFFECTS ON THE TRAJECTORY OF A REFLECTED SHOCK WAVE.
AD-614 378 DIV. 25

•RELATIVITY THEORY
DIFFERENTIAL GEOMETRY
SURVEY OF PUBLISHED LITERATURE ON THE HISTORICAL DEVELOPMENT OF SPINOR THEORY IN RIEMANNIAN GEOMETRY.
AD-614 049 DIV. 25

RADIO ASTRONOMY
EFFECTS OF GENERAL RELATIVITY ON INTERPLANETARY TIMEDELAY MEASUREMENTS.
AD-614 232 DIV. 25

•RELAXATION TIME
ELECTRONS
REPRINT: DETERMINATION OF ELECTRON RELAXATION TIME FROM THE GIANT QUANTUM OSCILLATIONS IN THE ACOUSTIC ABSORPTION OF METALS.
AD-614 527 DIV. 25

•RELIABILITY
STATISTICAL DISTRIBUTIONS
TWO NOTES ON ESTIMATING SHAPE PARAMETERS.
AD-614 419 DIV. 15

•RELIABILITY (ELECTRONICS)
INTEGRATED CIRCUITS
RELIABILITY OF INTEGRATED CIRCUITS USED IN MISSILE SYSTEMS.
AD-614 103 DIV. 8

MATHEMATICAL PREDICTION
ELECTRONIC SYSTEM RELIABILITY PREDICTION BY FUNCTION.
AD-614 227 DIV. 8

MILITARY REQUIREMENTS
ELECTRONIC SYSTEMS DIVISION. RELIABILITY/MAINTAINABILITY PROGRAM ELE

MENTS.
AD-619 429 DIV. 18

•REMOTE CONTROL SYSTEMS
MONITORS
PROCEEDINGS OF THE SYMPOSIUM ON REMOTE SENSING OF ENVIRONMENT (3RD), 14-16 OCTOBER 1964.
AD-619 032 DIV. 20

•RENDEZVOUS GUIDANCE
DISPLAY SYSTEMS
PILOT DISPLAY CONCEPT FOR NEAR-TARGET MANEUVERS DURING SPACE FLIGHT RENDEZVOUS.
AD-619 958 DIV. 12

•REPLACEMENT THEORY
OPTIMIZATION
OPTIMAL RANDOMIZED REPLACEMENT UNDER MARKOVIAN DETERIORATION.
AD-619 120 DIV. 26

•REPORTS
PREPARATION
WRITING AND SUBMITTING THE SUCCESSFUL PROPOSAL. A SELECTIVE ANNOTATED BIBLIOGRAPHY.
AD-619 269 DIV. 26

•REPTILES
AUDITORY PERCEPTION
REPRINT: AUDITORY RESPONSES IN THE ALLIGATOR LIZARD.
AD-619 339 DIV. 16
REPRINT: FURTHER STUDIES OF HEARING IN THE GEKKONID LIZARDS.
AD-619 340 DIV. 16

•RESONANCE
THERMAL RADIATION
RESONANCES IN THE SPECTRAL ENERGY DENSITY OF THERMAL FIELDS AND SPONTANEOUS EMISSION.
AD-619 061 DIV. 25

•RESONANCE ABSORPTION
ULTRASONIC RADIATION
REPRINT: RESONANT ABSORPTION OF ULTRASOUND BY OPENORBIT ELECTRONS IN CADMIUM.
AD-619 372 DIV. 25

•RESONANCE SCATTERING
ELEMENTARY PARTICLES
REPRINT: SCATTERING MATRIX APPROACH TO THE LAMBDA HYPERON-PION RESONANCE.
AD-619 374 DIV. 20

MESONS
NATURE OF THE RESONANCE IN THE STATIC PION-NUCLEON SCATTERING IN ONE-MESON APPROXIMATION.
AD-619 934 DIV. 20

PIONS
REPRINT: ISOBAR MECHANISM AND RESONANCE POLES FOR PION- BARYON SYSTEMS.
AD-619 149 DIV. 20

•RESONATORS
INTERFEROMETERS
FABRY-PEROT RESONANCES AT SMALL FRESNEL NUMBERS.
AD-619 063 DIV. 25

•RESPIRATORY DISEASES
ADENOVIRUSES
REPRINT: PATTERNS OF ADENOVIRUS INFECTIONS IN MARINE CORPS PERSONNEL. I. A 42-MONTH SURVEY IN RECRUIT AND NONRECRUIT POPULATIONS. II. LONGITUDINAL STUDY OF SUCCESSIVE ADVANCED RECRUIT TRAINING COMPANIES.
AD-619 306 DIV. 16

MILITARY PERSONNEL
REPRINT: RELATIONSHIP OF RHINOVIRUS INFECTION TO MILD UPPER-RESPIRATORY DISEASE. II. EPIDEMIOLOGIC OBSERVATIONS IN MALE MILITARY TRAINEES.
AD-619 308 DIV. 16

•RETINA
HISTOLOGY
INFORMATION PROCESSING IN THE FROG'S RETINA.
AD-619 249 DIV. 16

•RHENIUM COMPOUNDS
METALORGANIC COMPOUNDS
REPRINT: NEW TRIPHENYL PHOSPHINE HYDRIDES OF RHENIUM (NUOVI IDRURI TRIFENILFO SFINICI DI RENIO).
AD-619 207 DIV. 4

•ROCKET CASES
DESIGN
CRITICAL THICKNESS CONCEPT IN ROCKET CASE DESIGN.
AD-619 094 DIV. 27

•ROCKET MOTORS (LIQUID PROPELLANT)
SHOCK WAVES
REPRINT: SHOCK-WAVE PROPAGATION IN LIQUID PROPELLANT ROCKET ENGINES.
AD-619 201 DIV. 27

•ROCKET MOTORS (SOLID PROPELLANT)
THRUST
TRANSIENT CHAMBER PRESSURE AND THRUST IN SOLID ROCKET MOTORS.
AD-619 962 DIV. 27

•ROCKET NOZZLES
MAGNETIC FIELDS
EFFECT OF AN INTENSE MAGNETIC FIELD ON ROCKET NOZZLE HEAT TRANSFER. PART I: THEORY AND SUPERCONDUCTING MAGNET EXPERIMENTS.
AD-619 992 DIV. 27

•RODENTS
PARASITIC DISEASES
LUNG WORM ANGIOSTRONGYLUS CANTONENSIS OF RODENTS ON TAIWAN (FORMOSA) AND THE OFFSHORE ISLANDS.
AD-619 300 DIV. 16

•RUBIDIUM
SPECIFIC HEAT
SPECIFIC HEATS BELOW 320K OF POTASSIUM, RUBIDIUM AND CAESIUM.
AD-619 520 DIV. 25

•RUBY
PUMPING (ELECTRONICS)
QUANTUM AND SOLID STATE ELECTRONICS.
AD-619 007 DIV. 25

•RUTHENIUM ALLOYS
IRON ALLOYS
THERMODYNAMICS OF MARTENSITIC F. C. C. REVERSIBLY YIELDS B. C. C. AND F. C. C. REVERSIBLY YIELDS H. C. P. TRANSFORMATIONS IN THE IRON-RUTHENIUM SYSTEM.
AD-619 009 DIV. 17

•SALIVARY GLANDS
DENTISTRY
REPRINT: PAROTID FLUID FLOW RATE, PAROTID FLUID, AND SERUM INORGANIC PHOSPHATE CONCENTRATIONS AS RELATED TO DENTAL CARIES STATUS IN MAN.
AD-619 334 DIV. 16

•SAMARIUM
MANGANESE ALLOYS
INVESTIGATIONS OF THE SYSTEMS Y-MN, GD-MN AND SM-MN.
AD-619 462 DIV. 17

•SAMPLING
THEORY
NONPARAMETRIC LIFE TEST SAMPLING PLANS.
AD-619 490 DIV. 19

•SAND
COMPRESSIVE PROPERTIES
STUDY OF THE BEHAVIOR OF SOIL AND ROCK SUBJECTED TO HIGH STRESS LEVELS.
AD-619 481 DIV. 13

SOIL MECHANICS
LATERAL-PLATE TESTS WITH PLATE DIAMETER VARIED; MECHANICS OF SOIL RESISTANCE TO HORIZONTAL LOADING.
AD-613 991 DIV. 2

•SANDWICH PANELS
THERMAL DIFFUSION
RAPID MEASUREMENT OF THERMAL DIFFUSIVITY AT ELEVATED TEMPERATURES WITH AN APPLICATION TO A SANDWICH STRUCTURE.
AD-619 034 DIV. 30

•SATELLITES (ARTIFICIAL)
COSMIC RAYS
TRANSLATIONS OF RUSSIAN RESEARCH: INVESTIGATIONS OF RADIATIONS ON MAN-MADE EARTH SATELLITE COSMOS-17.
AD-619 402 DIV. 12

TRACKING
SATELLITE CONTROL FACILITY, DESIGN CRITERIA; DIRECT CONNECTION FOR CDC-160A COMPUTER TO TELETYPE TRANSMISSION LINES.
AD-619 002 DIV. 12
SATELLITE CONTROL FACILITY, DESIGN CRITERIA: EXTENDING THE FREQUENCY RESPONSE OF THE REMOTE STATION TAPE RECORDER/REPRODUCER EQUIPMENT.
AD-619 003 DIV. 12

•SCIENTIFIC PERSONNEL
USSR
TRANSLATION OF RUSSIAN ARTICLE: BIOGRAPHY OF GENERAL I. L. KNUNYANTS.
AD-619 029 DIV. 32

•SCIENTIFIC RESEARCH
AIR FORCE BUDGETS
COST OF BASIC RESEARCH EFFORT; AIR FORCE EXPERIENCE, 1954-1964.
AD-619 030 DIV. 30

SOURCES
REPRINT: U.S. GOVERNMENT SOURCES OF RESEARCH AND DEVELOPMENT INFORMATION.
AD-619 356 DIV. 32

•SECONDARY INJECTION
GAS FLOW
EXPERIMENTAL INVESTIGATION OF THE FLOW PHENOMENA INVOLVED IN GASEOUS THRUST DIRECTION CONTROL DEVICES.
AD-619 279 DIV. 27

•SEISMOLOGY
PACIFIC OCEAN
COMPUTER PROGRAM FOR

ROUTINE LOCATION OF Y-PHASE SOURCES IN THE PACIFIC OCEAN.
AD-619 273 DIV. 2

•SELECTION RULES
MESON REACTIONS
REPRINT: UNITARY SYMMETRY AND NON-LEPTONIC K-DECAYS.
AD-619 175 DIV. 20

•SELENIUM
POLAROGRAPHIC ANALYSIS
REPRINT: HIGHLY ACID-SUPPORTING ELECTROLYTES IN POLAROGRAPHY: CHANGES IN POLAROGRAPHIC WAVES OF SELENIUM (IV) UPON STANDING.
AD-619 382 DIV. 4

•SEMICONDUCTOR DEVICES
FREQUENCY STABILIZERS
MICROELECTRONIC FREQUENCY AND TIME STANDARD.
AD-613 999 DIV. 8

INTEGRATED CIRCUITS
SMALL SIGNAL SEMICONDUCTOR COMPOSITS: INTEGRATED IF AMPLIFIER, LIMITER, SQUELCH, AND AUDIO CIRCUITS FOR MANPACK RADIO EQUIPMENT.
AD-619 090 DIV. 8

SILICON
INTEGRATED SILICON DEVICE TECHNOLOGY. VOLUME VI. UNIPOLAR TRANSISTORS.
AD-613 991 DIV. 8

•SEMICONDUCTORS
ATOMIC ENERGY LEVELS
GROUND STATE OF AN ELECTRON GAS IN A MAGNETIC FIELD.
AD-619 254 DIV. 25

COMPOSITE MATERIALS
ELECTRICAL AND ELECTRO-OPTICAL PROPERTIES OF INTERFACE ALLOY HETEROJUNCTIONS.
AD-619 320 DIV. 25

DIELECTRIC PROPERTIES
SEMICONDUCTING MATERIALS. PART III. AN INVESTIGATION OF THE DIELECTRIC PROPERTIES OF SINGLE-CRYSTAL VERSUS POLYC RYSTALLINE MATERIALS.
AD-619 472 DIV. 14

ELECTROCHEMISTRY
REPRINT: ELECTROCHEMICAL DEMBER EFFECT IN SEMICONDUCTORS.
AD-619 180 DIV. 25

ELECTRON CAPTURE
REPRINT: HOT-ELECTRON LOSS VIA WIGGLED AUGER RECOMBI NATION IN SEMICONDUCTORS.
AD-619 358 DIV. 25

ELECTRON TRANSITION
REPRINT: PHOTOGENERATION OF FREE CARRIERS IN ORGANIC CRYSTALS VIA EXCITON-EXCITON INTERACTIONS.
AD-619 385 DIV. 25

FIELD THEORY
ELECTRO-OPTICAL METHOD FOR INVESTIGATION OF FIELD AND CURRENT DISTRIBUTIONS IN SEMICONDUCTORS AND LAYER-LIKE FIELD DISTRIBUTIONS IN PHOTOCONDUCTORS.
AD-619 439 DIV. 25

MAGNETIC PROPERTIES
REPRINT: HIGH-FIELD MAGNETORESISTANCE OF INHOMOGENEOUS SEMICONDUCTORS AND PLASMAS. TWO-DIMENSIONAL INHOMOGENEITY DISTRIBUTIONS.
AD-619 163 DIV. 25

•SENSORY DEPRIVATION
PERFORMANCE (HUMAN)
REPRINT: ELECTROPHYSIO LOGICAL EFFECTS OF THE INTERACTION BETWEEN TASK DEMANDS AND SENSORY INPUT.
AD-619 532 DIV. 28

•SENSORY PERCEPTION
BRAIN
REPRINT: EVOKED ACTIVITY IN THE CAUDATE NUCLEUS OF THE CAT IN RESPONSE TO VARIOUS KINDS OF AFFERENT STIMULI. I. MACROPHYSIOLOGICAL STUDY.
AD-619 510 DIV. 16

•SEPARATION
COBALT
TRANSLATION OF RUSSIAN RESEARCH. SETTLING-OUT OF COBALT FROM LEAN SOLUTIONS WITH SODIUM SULFIDE.
AD-619 405 DIV. 17

•SEQUENTIAL ANALYSIS
THEORY
SEQUENTIAL RANKING PROCEDURES.
AD-619 271 DIV. 15

•SERIES
MESON SCATTERING
REPRINT: CROSSING RELATIONS AND LEGENDRE EXPANSIONS IN PION-PION SCATTERING.
AD-619 153 DIV. 20

•SERVOMECHANISMS
ANALOG-DIGITAL COMPUTERS
THE ANALYSIS OF ROUND-OFF AND TRUNCATION ERRORS OF THE CONTROLLER IN A HYBRID (DIGITAL-ANALOG) CONTROL SYSTEM.
AD-619 281 DIV. 30

HYDRAULIC SYSTEMS
REPRINT: ANALYSIS OF A LOADED HIGH-PRESSURE HYDRAULIC ONOFF SERVOMECHANISM.
AD-619 535 DIV. 26

•SET THEORY
MEASURE THEORY
REPRINT: CONSISTENT ESTIMATES AND ZERO-ONE SETS.
AD-613 917 DIV. 15

•SHIELDING
NEUTRON SCATTERING
INTERACTIONS OF 14.6-MEV NEUTRONS IN IRON, LITHIUM-7, AND CARBON.
AD-619 451 DIV. 20

NEUTRON TRANSPORT THEORY
FORMULATION OF RADIATION TRANSPORT SOLUTIONS FOR SHIELDING APPLICATIONS, INCLUDING INTEGRAL TRANSFORM METHODS, MATRIX TECHNIQUES, AND ASYMPTOTIC APPROXIMATIONS.
AD-619 250 DIV. 20

SPACECRAFT
INFLUENCE OF SHIELD GEOMETRY ON AIR DOSE AND TISSUE DOSE FROM PROTONS WITHIN A SPACE VEHICLE.
AD-613 993 DIV. 20

•SHIP HULLS
ORGANIC COATINGS
REPRINT: PROBLEMS OF ADHESION WITH CATHODIC PROTECTION.
AD-619 551 DIV. 4

•SHIPS
MANEUVERABILITY
FREE-RUNNING MODEL TECHNIQUES FOR THE EVALUATION OF SHIP HANDLING QUALITIES.
AD-619 114 DIV. 31

•SHOCK TUBES
MAGNETOHYDRODYNAMICS
REPRINT: CURRENT DISTR IBUTION IN A MAGNETIC ANNULAR SHOCK TUBE.
AD-619 212 DIV. 30

•SHOCK WAVES
BALLISTICS
STRESS WAVES IN BOUNDED MEDIA RESULTING PRIMARILY FROM EXPLOSIONS AND/OR PROJECTILE IMPACT.
AD-613 935 DIV. 22

EXPLOSIVES INITIATORS
EQUATIONS OF STATE IN SHOCK INITIATION PROBLEMS.
AD-613 989 DIV. 4

GAS FLOW
CALIBRATION OF A PRESSURE SENSOR FOR MEASUREMENTS IN CONTINUUM AND RAREFIED GAS FLOWS.
AD-619 424 DIV. 30

PLASMA PHYSICS
SHOCK WAVES.
AD-619 053 DIV. 25

PROPAGATION
TRANSLATION OF RUSSIAN RESEARCH: ON THE PROPAGATION OF A SHOCK WAVE IN THE GROUND DURING IMPACT OF A VERY FAST METEORITE AGAINST THE SURFACE OF THE PLANET.
AD-619 018 DIV. 2
REPRINT: SHOCK-WAVE PROPAGATION IN LIQUID PROPELLANT ROCKET ENGINES.
AD-619 201 DIV. 27

THEORY
A CONICAL THIN-SHOCK-LAYER THEORY UNIFORMLY VALID IN THE ENTROPY LAYER.
AD-619 444 DIV. 9

TRAJECTORIES
REPRINT: END-WALL HEAT-TRANSFER EFFECTS ON THE TRAJECTORY OF A REFLECTED SHOCK WAVE.
AD-619 378 DIV. 25

VORTICES
REPRINT: INTERACTION OF A STARTING VORTEX AS WELL AS A VORTEX STREET WITH A TRAVELING SHOCK WAVE.
AD-619 211 DIV. 9

•SHOCK (MECHANICS)
HYDRAULIC ACCUMULATORS
THE EFFECTS OF FLUID RESONANCE ON THE BOUNDARY STRESSES OF A FLUID-FILLED CAVITY.
AD-619 418 DIV. 13

•SHOCK (PATHOLOGY)
CHEMOTHERAPY
USE OF ISOPROTERENOL AND PHENOXYBENZAMINE IN TREATMENT OF ENDOTOXIN SHOCK.
AD-619 266 DIV. 16

•SIGMA HYPERONS
ABSORPTION
REPRINT: ABSORPTION OF SIGMA(-) HYPERONS IN PHOTOGRAPHIC EMULSION NUCLEI.
AD-619 213 DIV. 20

•SIGNALS
DETECTION

THEORY OF SIGNAL DETECTAB ILITY: COMPOSITE DEFERRED DECISION THEORY.
AD-614 480 DIV. 8

DISTORTION
SIGNAL DISTORTION IN A FREQUENCY DIVIDER.
AD-614 429 DIV. 8

•SILANES
POLYMERS
SYNTHESIS OF ELASTOMERS CONTAINING SI-N BONDS IN THE MAIN CHAIN.
AD-614 473 DIV. 4

SYNTHESIS (CHEMISTRY)
REPRINT: SYNTHESIS OF A SILAZAROPHENANTHRENE, 10,10DIMETHYL-9,10-AZASILADIHY DROPHENANTHRENE.
AD-613 929 DIV. 4
NEW ARYLOXY ALKOXY SILANES WHICH ARE POTENTIAL GLASS FIBER FINISHES.
AD-613 936 DIV. 14

•SILICIDES
RARE EARTH COMPOUNDS
REPRINT: POLYMORPHISM OF RARE EARTH DISILICIDES.
AD-614 137 DIV. 25

•SILICON
ADDITIVES
SILICON AND ZINC EFFECT ON MAGNESIUM-LITHIUM AND MAGNESIUM-LITHIUM-SILVER ALLOYS.
AD-614 422 DIV. 17

DIODES (SEMICONDUCTOR)
SILICON P-N JUNCTIONS AS AUTOMATIC GAIN CONTROL (AGC) ELEMENTS FOR VIDEO PULSES.
AD-614 280 DIV. 8

EXCITATION
REPRINT: EFFECT OF UNIAXIAL STRESS ON THE EXCITATION SPECTRA OF DONORS IN SILICON.
AD-614 529 DIV. 25

•SILICON COMPOUNDS
MOLECULAR ISOMERISM
REPRINT: REARRANGEMENT OF 1,2-BIS(TRIMETHYLSILYL) HYDRAZINE.
AD-614 290 DIV. 4

POLYMERIZATION
SYNTHESIS OF ELASTOMERS CONTAINING SI-N BONDS IN THE MAIN CHAIN.
AD-614 473 DIV. 4

•SILICONE PLASTICS
SYNTHESIS (CHEMISTRY)
SYNTHESIS OF ELASTOMERS CONTAINING SI-N BONDS IN THE MAIN CHAIN.
AD-614 473 DIV. 4

•SILVER
ELECTRODES
OXIDES ON THE SILVER ELECTRODE. PART 2. X-RAY DIFFRACTION STUDIES OF THE WORKING SILVER ELECTRODE.
AD-614 058 DIV. 7

•SILVER ALLOYS
CRYSTAL LATTICE DEFECTS
STRUCTURE OF DEFORMED INTERNALLY OXIDIZED ALLOYS.
AD-614 080 DIV. 17

RECRYSTALLIZATION
INFLUENCE OF A FINELY DISPERSED SECOND PHASE ON RECRYSTALLIZATION. ANNEALING BEHAVIOR OF INTERNALLY OXIDIZED ALLOYS OF SILVER CONTAINING MAGNESIUM AND COPPER CONTAINING ALUMIUM.
AD-613 971 DIV. 17

•SINGLE CRYSTALS
CADMIUM COMPOUNDS
QUENCHING AND POST-IRRADIATION STUDIES ON CDS SINGLE CRYSTALS. TRANSPORT PROPERTIES OF BISMUTH ROLLED THIN FOILS.
AD-614 485 DIV. 25

CRYSTAL GROWTH
TRANSLATION OF RUSSIAN RESEARCH: GROWTH OF SINGLE CRYSTALS NEMATIC FILMS.
AD-613 984 DIV. 25
REPRINT: RAPID-FREEZE METHOD FOR GROWTH OF BISMUTH SINGLE CRYSTALS.
AD-614 318 DIV. 17

ELASTICITY
REPRINT: ELASTIC CONSTANTS OF HGTE.
AD-614 308 DIV. 25

LEAD COMPOUNDS
REPRINT: DIFFUSION OF SULFUR 35 IN SINGLE CRYSTALS OF LEAD SULFIDE AS A FUNCTION OF STOICHIOMETRY AND DOPING ADDITIONS.
AD-614 550 DIV. 25

POLYCYCLIC COMPOUNDS
REPRINT: DIFFUSION IN ORGANIC CRYSTALS. SELF-DIFFUSION IN ANTHRACENE.
AD-614 531 DIV. 25

RARE EARTH COMPOUNDS
GROWTH AND CHARACTERIZATION OF SINGLE CRYSTALS OF RARE EARTH COMPOUNDS.
AD-614 435 DIV. 25

•SINTERING
MOLYBDENUM
EFFECT OF HEAT TREATMENT ON THE MICROSTRUCTURE AND PROPERTIES OF SPRAYED MOLYBDENUM.
AD-614 127 DIV. 26

RARE EARTH ELEMENTS
SINTER PROCESS, USING MERCURY AS AN 'AUXILIARY COMPONENT' AS APPLIED TO RE-MN SYSTEMS. DIFFERENTIAL-THERMALAND MAGNETO-THERMAL-ANALYSIS OF THE SYSTEM GD-MN (0 -50% W.% MN).
AD-614 464 DIV. 17

•SNOW
AGING (MATERIALS)
AGE HARDENING OF SNOW AT THE SOUTH POLE.
AD-614 430 DIV. 13

•SNOW REMOVAL
REVIEWS
SURVEY OF SNOW AND ICE REMOVAL TECHNIQUES.
AD-614 431 DIV. 32

•SOAPS
FILMS
REPRINT: SOAP FILMS AND SOME PROBLEMS IN SURFACE AND COLLOID CHEMISTRY.
AD-614 293 DIV. 4

•SOCIAL SCIENCES
BIBLIOGRAPHIES
SELECTED BIBLIOGRAPHY OF PUBLICATIONS, PAPERS, AND REPORTS IN THE SOCIAL, BEHAVIORAL, AND ADMINISTRATIVE SCIENCES.
AD-614 066 DIV. 32

•SODIUM COMPOUNDS
CHLORIDES
MECHANICAL PROPERTIES OF POLYCRYSTALLINE SODIUM CHLORIDE.
AD-614 054 DIV. 25

SULFIDES
TRANSLATION OF RUSSIAN RESEARCH. SETTLING-OUT OF COBALT FROM LEAN SOLUTIONS WITH SODIUM SULFIDE.
AD-614 405 DIV. 17

•SOIL MECHANICS
COMPRESSIVE PROPERTIES
STUDY OF THE BEHAVIOR OF SOIL AND ROCK SUBJECTED TO HIGH STRESS LEVELS.
AD-614 481 DIV. 13

LOAD DISTRIBUTION
EFFECTS OF BOUNDARY FRICTION ON TRANSMISSION OF STATIC STRESS THROUGH AND IN CYLINDRICAL TANKS.
AD-614 108 DIV. 13

LOADING (MECHANICS)
LATERAL-PLATE TESTS WITH PLATE DIAMETER VARIED; MECHANICS OF SOIL RESISTANCE TO HORIZONTAL LOADING.
AD-613 991 DIV. 2

•SOLAR ATMOSPHERE
ACOUSTICS
REPRINT: PROPAGATION OF ACOUSTIC WAVES THROUGH THE SOLAR CHROMOSPHERE.
AD-613 914 DIV. 2

RADIO ASTRONOMY
TRANSLATION OF RUSSIAN RESEARCH: USE OF RADIO DATA TO DETERMINE THE POSITION OF THE REGION IN WHICH THE CHARACTERISTICS OF THE SOLAR ATMOSPHERE CHANGE RAPIDLY.
AD-613 981 DIV. 2

•SOLAR ECLIPSES
ASTRONOMICAL DATA
TRANSLATION OF RUSSIAN RESEARCH: OBSERVATIONAL DATA FROM THE ANNULAR SOLAR ECLIPSE OF 21 JULY 1962.
AD-613 978 DIV. 2

•SOLAR FLARES
ALPHA PARTICLES
REPRINT: SOLAR FLARE HIGH ENERGY ALPHA PARTICLES AND THEIR STORAGE IN INTERPLANETARY SPACE.
AD-614 217 DIV. 2

•SOLAR RADIATION
ATMOSPHERE MODELS
MODEL ATMOSPHERES DETERMINED BY ABSORPTION OF SOLAR RADIATION.
AD-614 085 DIV. 2

COSMIC RAY BURSTS
AN INTERPLANETARY DIFFUSION MODEL FOR THE TIME BEHAVIOR OF INTENSITY IN A SOLAR COSMIC RAY EVENT.
AD-614 100 DIV. 2

•SOLID ROCKET PROPELLANTS
PHYSICAL PROPERTIES
SOLID ROCKET STRUCTURAL INTEGRITY ABSTRACTS, VOLUME II, NO. 2.
AD-614 484 DIV. 10

•SOLID SOLUTIONS
ELECTROCHEMISTRY
REPRINT: ELECTROCHEMICAL BEHAVIOR OF TIOX SOLID

SOLUTIONS IN AQUEOUS HF AND HF-HCL MIXTURES.
AD-614 183 DIV. 4

•SOLID STATE PHYSICS
COMPOSITE MATERIALS
ELECTRICAL AND ELECTRO-OPTICAL PROPERTIES OF INTERFACE ALLOY HETEROJUNCTIONS.
AD-614 320 DIV. 25

REVIEWS
SOLID STATE RESEARCH.
AD-613 961 DIV. 25
VERY LOW FREQUENCY PROPAG ATION; ELECTRON AND SOLID STATE PHYSICS; AUTOMATIC CONTROL; COMMUNICATIONS AND NETWORKS; ELECTROMAGNETIC RADIATION.
AD-614 130 DIV. 30

SCIENTIFIC RESEARCH
MIT SOLID-STATE AND MOLECULAR THEORY GROUP PROGRESS REPORT.
AD-613 996 DIV. 25

THEORY
FUNDAMENTAL PROBLEMS OF SOLIDS.
AD-614 126 DIV. 25

•SOLIDS
MAGNETO-OPTIC EFFECT
REPRINT: FARADAY EFFECT IN SOLIDS.
AD-614 558 DIV. 25

•SONIC FATIGUE
MEASUREMENT
TRANSDUCERS FOR SONIC FATIGUE MEASUREMENTS.
AD-613 946 DIV. 30

•SOUND TRANSMISSION
UNDERWATER
REPRINT: ANALYSIS OF SPREADING LOSS FOR REFRACTED/REFLECTED RAYS IN CONSTANT-VELOCITY-GRADIENT MEDIA.
AD-614 196 DIV. 25

VELOCITY
TRANSLATION OF RUSSIAN RESEARCH: SPEED OF SOUND IN TWOPHASE MEDIA.
AD-614 018 DIV. 25

•SOUNDING ROCKETS
ANTENNAS
REPRINT: NRC DESIGNS ANTENNA FOR S-BAND BEACON IN SOUNDING ROCKETS. RESONANT SHUNT-FED RADIATOR USES AIR DIELECTRIC TO WITHSTAND HEAT.
AD-614 525 DIV. 8

•SPACE CREWS
HIBERNATION
TRANSLATION OF RUSSIAN RESEARCH: HIBERNATION OF SPACE CREWS ON LONG SPACE FLIGHTS.
AD-614 394 DIV. 16

•SPACE FLIGHT
RENDEZVOUS GUIDANCE
PILOT DISPLAY CONCEPT FOR NEAR-TARGET MANEUVERS DURING SPACE FLIGHT RENDEZVOUS.
AD-613 958 DIV. 12

•SPACE PERCEPTION
GEOMETRIC FORMS
REPRINT: VISUAL SPACE: A TEST OF THE CONSTANT CURVATURE HYPOTHESIS.
AD-614 363 DIV. 28

SEPARATION
REPRINT: THE BISECTION OF A VISUAL EXTENT.
AD-614 338 DIV. 28

•SPACE PROBES
INSTRUMENTATION
PROCEEDINGS OF THE SYMPOSIUM ON REMOTE SENSING OF ENVIRONMENT (3RD), 14-16 OCTOBER 1964.
AD-614 032 DIV. 30

•SPACE SURVEILLANCE SYSTEMS
RADAR EQUIPMENT
EFFICIENCY FUNCTION FOR RATING MECHANICAL SCAN-TRACK RADARS.
AD-614 477 DIV. 6

•SPACE VEHICLES
CHECKOUT PROCEDURES
GROWTH OF AUTOMATION IN PRELAUNCH CHECKOUT FOR SPACE VEHICLES.
AD-614 410 DIV. 12

•SPACECRAFT NUCLEAR PROPULSION
NUCLEAR REACTORS
CAVITY NUCLEAR REACTORS.
AD-613 998 DIV. 21

•SPARK SHADOWGRAPH PHOTOGRAPHY
SUPERSONIC FLOW
TRANSLATION OF RUSSIAN RESEARCH: USE OF SHADOWGRAPH MEASUREMENTS FOR QUALITATIVE RESEARCH OF A SUPERSONIC FLOW AROUND A WING PROFILE.
AD-614 389 DIV. 9

•SPECIAL FUNCTIONS (MATHEMATICAL)
GRAVITY
GRAVITY DISTURBANCE COMPONENTS FROM A SPHERICAL HARMONIC EXPANSION OF THE DISTURBING POTENTIAL.
AD-613 956 DIV. 2

•SPECTROSCOPY
LUMINESCENCE
REPRINT: DETERMINATION OF RADIAL DISTRIBUTION OF VOLUME RADIANCE OF A LUMINOUS MEDIUM CONFINED IN A GLASS CYLINDER.
AD-614 328 DIV. 25

SOLID STATE PHYSICS
SOLID STATE RESEARCH.
AD-613 961 DIV. 25

TISSUES (BIOLOGY)
REPRINTS: ELECTRON SPIN RESONANCE CHARACTERISTICS OF SOME NORMAL TISSUES; EFFECT OF MICROWAVE POWER.
AD-614 343 DIV. 16

•SPECTRUM ANALYZERS
ULTRASONIC RADIATION
ULTRASONIC SPECTROSCOPY OF STEEL.
AD-614 113 DIV. 26

•SPEECH
INTELLIGIBILITY
REPRINT: SEMANTIC COMPONENTS OF THE QUALITY OF PROCESSED SPEECH.
AD-614 147 DIV. 28
REPRINT: ARTICULATION-TESTING METHODS: CONSONANTAL DIFFERENTIATION WITH A CLOSED-RESPONSE SET.
AD-614 336 DIV. 5

•SPEECH RECOGNITION
AUDITORY PERCEPTION
REPRINT: SEMANTIC COMPONENTS OF THE QUALITY OF PROCESSED SPEECH.
AD-614 147 DIV. 28

COMMUNICATION THEORY
IDENTIFICATION OF ELEMENTARY AUDITORY DISPLAYS: EFFECT OF UNBALANCED PROBABILITIES OF OCCURRENCE.
AD-614 297 DIV. 8

VOICE COMMUNICATION SYSTEMS
REPRINT: ARTICULATION-TESTING METHODS: CONSONANTAL DIFFERENTIATION WITH A CLOSED-RESPONSE SET.
AD-614 336 DIV. 5

•SPEECH REPRESENTATION
LANGUAGE
SEMANTIC BASIS OF COMMUNI CATION.
AD-614 093 DIV. 32

•SPHERES
FLUID DYNAMIC PROPERTIES
EXPERIMENTS ON THE LIFT AND DRAG OF SPHERES SUSPENDED IN A LOW REYNOLDS NO. POISEUILLE FLOW.
AD-613 939 DIV. 9

GASES
REPRINT: NON-RADIAL OSCILLATIONS OF GASEOUS MASSES.
AD-614 330 DIV. 2

HARMONIC OSCILLATORS
REPRINT: ON THE OSCILL ATIONS OF THE MACLAURIN SPHEROID BELONGING TO THE THIRD HARMONICS.
AD-614 155 DIV. 2

VIBRATION
COMPLEX POISSON'S RATIO AND DILATATION CONSTANTS FROM FORCED VIBRATION OF A SPHERE.
AD-614 461 DIV. 25

•SPIN
PARTICLES
REPRINT: ON THE CONCEPTION OF GENERALIZED SPIN OF FREE DIRAC PARTICLES.
AD-614 219 DIV. 25

•SPINELS
VANADIUM COMPOUNDS
REPRINT: MAGNETIC PROPERTIES OF V(3) IONS IN CUBIC SPINELS.
AD-614 319 DIV. 25

•SPIRAL ANTENNAS
ANTENNA RADIATION PATTERNS
DIPOLE EXCITED UNIDIRECTI ONALLY CONDUCTING SPHERE.
AD-614 078 DIV. 8

•STAINLESS STEEL
STABILITY
DIMENSIONAL STABILITY OF SELECTED ALLOY SYSTEMS.
AD-613 931 DIV. 17

•STAR TRACKERS
OPTICAL INSTRUMENTS
EXPERIMENTAL VERIFICATION OF STAR IDENTIFICATION BY OPTICAL RADIATION ANALYSIS.
AD-614 238 DIV. 19

•STARS
INFRARED SPECTROSCOPY
REPRINT: INFRARED PHOTOMETRY OF M-DWARF STARS.
AD-614 354 DIV. 2

OPTICAL ANALYSIS
EXPERIMENTAL VERIFICATION OF STAR IDENTIFICATION BY OPTICAL RADIATION ANALYSIS.
AD-614 238 DIV. 19
REPRINT: MULTICOLOR PHOTOMETRY OF CARBON STARS.
AD-614 361 DIV. 2

•STATISTICAL ANALYSIS
STOCHASTIC PROCESSES
ON FACTORING THE CORRELATIONS OF DISCRETE MULTI-VARIABLE STOCHASTIC PROCESSES.
AD-614 040 DIV. 15

THEOREMS
REPRINT: A THEOREM ON RANK ORDERS FOR TWO CENSORED SAMPLES.
AD-614 301 DIV. 15

•STATISTICAL DISTRIBUTIONS
ATOMIC CHARGE
REPRINT: CHARGE-STATE CORRELATIONS IN AR() - AR COLLISIONS.
AD-614 545 DIV. 25

OPTIMIZATION
REPRINT: OPTIMUM STRATIFICATION WITH TWO CHARACTERS.
AD-614 526 DIV. 15

RELIABILITY
TWO NOTES ON ESTIMATING SHAPE PARAMETERS.
AD-614 419 DIV. 15

•STATISTICAL FUNCTIONS
MOLECULAR STRUCTURE
REPRINT: AUTO-AND CROSS-CORRELATION FUNCTIONS USED AS TOOLS FOR INFORMATION RETRIEVAL IN ELECTRON DIFFRACTION STRUCTURE STUDIES.
AD-614 534 DIV. 25

THEORY
TRANSLATION OF RUSSIAN RESEARCH: ON THE THEORY OF RANDOM FUNCTIONS AND THE CONTROL OF PROCESSES ON THE BASIS OF INCOMPLETE DATA.
AD-613 974 DIV. 15

•STEEL
DIES
TRANSLATION OF RUSSIAN RESEARCH: NEW 5KHGSVF FORGING STEEL.
AD-614 390 DIV. 17

HEAT TREATMENT
HOMOGENIZATION OF HIGH-STRENGTH STEEL AT 2500 F.
AD-614 277 DIV. 26
REPRINT: RECRYSTALLIZATION KINETICS OF MARTENSITIC EXTRA LOW CARBON STEELS.
AD-614 501 DIV. 17

MARTENSITE
ROLE OF CARBON AND FINE STRUCTURE IN THE HARDENING OF IRON-NICKEL-CARBON MARTENSITES.
AD-614 447 DIV. 17

NON DESTRUCTIVE TESTING
ULTRASONIC SPECTROSCOPY OF STEEL.
AD-614 113 DIV. 26

STRAIN (MECHANICS)
BAUSCHINGER EFFECT IN A HIGH STRENGTH STEEL.
AD-614 115 DIV. 17

SUBMARINE HULLS
MECHANICAL AND CHEMICAL PROPERTIES OF THE HY 100 PRESSURE HULLS OF THE SUBMARINE, ALVIN.
AD-614 011 DIV. 31

•STEREOCHEMISTRY
ACETATES
REPRINT: PYROLYSIS STUDIES. STERIC INHIBITION OF RESONANCE IN THE VAPOR PHASE.
AD-613 921 DIV. 4

•STEREOSCOPES
PHOTOGRAMMETRY
TRANSLATION OF RUSSIAN RESEARCH: THE USD-1 DROBYSHEV UNIVERSAL STEREOGRAPH.
AD-614 107 DIV. 2

•STEREOSCOPIC MAP PLOTTERS
PLASTICS
TRANSLATION OF RUSSIAN RESEARCH: USE OF TRANSPARENT PLASTICS IN STEREOTOPOGRAPHIC WORK.
AD-614 106 DIV. 2

•STEROCHEMISTRY
NITRAMINES
REPRINT: REARRANGEMENT OF AROMATIC N-NITROAMINES. ACID-CATALYSED REARRANGEMENT OF N-NITROANILINE.
AD-614 215 DIV. 4

•STEROIDS
INFECTIOUS DISEASES
REPRINT: OCULAR COMPLICATIONS OF STEROID THERAPY.
AD-614 186 DIV. 16

•STOCHASTIC PROCESSES
FACTOR ANALYSIS
ON FACTORING THE CORRELATIONS OF DISCRETE MULTI-VARIABLE STOCHASTIC PROCESSES.
AD-614 040 DIV. 15

LINEAR PROGRAMMING
SOME RESULTS AND PROBLEMS IN STOCHASTIC LINEAR PROGRAMMING.
AD-613 990 DIV. 15

REPLACEMENT THEORY
OPTIMAL RANDOMIZED REPLACEMENT UNDER MARKOVIAN DETERIORATION.
AD-614 120 DIV. 26

•STORAGE BATTERIES
ELECTRODES
ZINC ELECTRODES FOR LONG LIFE, LIGHT WEIGHT SILVER OXIDEZINC SECONDARY BATTERIES.
AD-614 119 DIV. 7

•STORMS
SEACOAST
REPRINT: COASTAL STORMS OF THE EASTERN UNITED STATES.
AD-614 189 DIV. 2

•STRAIN GAGES
ERRORS
TRANSDUCERS FOR SONIC FATIGUE MEASUREMENTS.
AD-613 946 DIV. 30

•STRAIN (MECHANICS)
CRYSTAL LATTICES
REPRINT: THE EFFECT OF STRAIN ON THE EXCITON SPECTRUM OF GERMANIUM.
AD-614 200 DIV. 25

STEEL
BAUSCHINGER EFFECT IN A HIGH STRENGTH STEEL.
AD-614 115 DIV. 17

•STRANGE PARTICLES
NUCLEAR REACTIONS
REPRINT: POSSIBLE EXPERIMENTAL CONSEQUENCES OF TRIANGLE SINGULARITIES IN STRANGE-PARTICLE PRODUCTION PROCESSES.
AD-614 144 DIV. 20

•STRESS (PHYSIOLOGY)
FLIGHT
REPRINT: FLYING STRESS IN RELATION TO FLYING PROFICIENCY.
AD-614 332 DIV. 16

•STRESSES
PROJECTILES
STRESS WAVES IN BOUNDED MEDIA RESULTING PRIMARILY FROM EXPLOSIONS AND/OR PROJECTILE IMPACT.
AD-613 935 DIV. 22

SILICON
REPRINT: EFFECT OF UNIAXIAL STRESS ON THE EXCITATION SPECTRA OF DONORS IN SILICON.
AD-614 529 DIV. 25

•STRONTIUM
SEPARATION
REPRINT: THERMAL DESORPTION OF SR FROM W.
AD-614 142 DIV. 25

•STRUCTURAL GEOLOGY
CALIFORNIA
REPRINT: CRUSTAL STRUCTURE IN CENTRAL CALIFORNIA IN RELATION TO THE SIERRA NEVADA.
AD-614 352 DIV. 2

•STRUCTURAL PARTS
CONFIGURATION
REPRINT: THE SIGNIFICANCE OF SINGULAR CONFIGURATIONS OF STRUCTURES FROM THE STRENGTH OF MATERIALS POINT OF VIEW.
AD-614 541 DIV. 25

•STRUCTURAL SHELLS
MOTION
REPRINT: INFLUENCE OF BOUNDARY CONDITIONS ON THE MODAL CHARACTERISTICS OF THIN CYLINDRICAL SHELLS.
AD-614 371 DIV. 25

•STYRENE PLASTICS
POLYMERIZATION
REPRINT: ANIONIC POLYMERIZATION OF BUTADIENE AND STYRENE.
AD-614 498 DIV. 4

•SUBJECT INDEXING
INFORMATION RETRIEVAL
SCIENCE-TECHNOLOGY SUBJECT-HEADING LISTS IN ENGLISH, RECENT OR STILL USEFUL IN PROGRAMMING INFORMATION RETRIEVAL SYSTEMS.
AD-614 438 DIV. 32

•SUBLIMATION
INTERMETALLIC COMPOUNDS
REPRINT: PARTIAL PRESSURES AND GIBBS FREE ENERGY OF FORMATION FOR CONGRUENTLY SUBLIMING CDTE(C).
AD-614 292 DIV. 25

•SUBMARINE HULLS
FILAMENT WOUND CONSTRUCTION
INTERLAMINAR SHEAR OF FILAMENT-WOUND REINFORCED PLASTICS.
AD-613 997 DIV. 14

MATERIALS
MATERIALS SURVEY FOR THE RESCUE AND SEARCH VEHICLES OF THE DEEP-SUBMERGENCE SYSTEMS PROJECT.
AD-614 421 DIV. 31

OCEANOGRAPHIC VESSELS
MECHANICAL AND CHEMICAL PROPERTIES OF THE HY 100 PRESSURE HULLS OF THE SUBMARIN', ALVIN.
AD-614 011 DIV. 31

•SUBMARINE NOISE
TEST FACILITIES
PORTSMOUTH NAVAL SHIPYARD FACILITIES FOR NOISE MEASUREMENT AND REDUCTION.
AD-619 126 DIV. 31

•SUBMARINES
LIFE SUPPORT
PRESENT STATUS OF CHEMICAL RESEARCH IN ATMOSPHERE PURIFICATION AND CONTROL ON NUCLEAR-POWERED SUBMARINES.
AD-619 261 DIV. 31

•SUBMINIATURE ELECTRONIC EQUIPMENT
TIME-INTERVAL COUNTERS
MICROELECTRONIC FREQUENCY AND TIME STANDARD.
AD-613 999 DIV. 8

•SUBSTITUTION REACTIONS
DEUTERIUM
REPRINT: VIBRATIONAL EXCITATION IN SOME FOUR-CENTER TRANSITION STATES.
AD-619 548 DIV. 4

•SULFUR
DIFFUSION
REPRINT: DIFFUSION OF SULFUR 35 IN SINGLE CRYSTALS OF LEAD SULFIDE AS A FUNCTION OF STOICHIOMETRY AND DOPING ADDITIONS.
AD-619 550 DIV. 25

•SULFURIC ACID
POLAROGRAPHIC ANALYSIS
REPRINT: HIGHLY ACID-SUPPORTING ELECTROLYTES IN POLAROGRAPHY: CHANGES IN POLAROGRAPHIC WAVES OF SELENIUM (IV) UPON STANDING.
AD-619 382 DIV. 4

•SUN
SPECTROSCOPY
REPRINT: NEUTRINO-SPECTROSCOPY OF THE SOLAR INTERIOR.
AD-619 323 DIV. 2

•SUPERCONDUCTIVITY
NIOBIUM
REPRINT: INFLUENCE OF CONTROLLED ADDITIONS OF OXYGEN ON THE SUPERCONDUCTIVITY OF NIOBIUM.
AD-619 296 DIV. 25

•SUPERCONDUCTORS
METAL FILMS
REPRINT: EFFECT OF MAGNETIC FIELD ON THERMAL CONDUCTIVITY AND ENERGY GAP OF SUPERCONDUCTING FILMS.
AD-619 369 DIV. 25

THERMAL CONDUCTIVITY
REPRINT: CALCULATION OF THE QUASIPARTICLE RECOMBINATION TIME IN A SUPERCONDUCTOR.
AD-619 367 DIV. 25

•SUPERSONIC FLOW
HANDBOOKS
HANDBOOK OF SUPERSONIC AERODYNAMICS: PROPERTIES OF GASES.
AD-613 972 DIV. 9

WINGS
TRANSLATION OF RUSSIAN RESEARCH: USE OF SHADOWGRAPH MEASUREMENTS FOR QUALITATIVE RESEARCH OF A SUPERSONIC FLOW AROUND A WING PROFILE.
AD-619 389 DIV. 9

•SURFACE PROPERTIES
METAL FILMS
REPRINT: EVIDENCE OF UNPINNED SURFACE SPINS FROM PARALLEL SPIN-WAVE RESONANCES IN PERMALLOY FILMS.
AD-619 359 DIV. 25

NUCLEATION
REPRINT: ON THE CONTACT ANGLE IN HETEROGENEOUS NUCLEATION UPON A SUBSTRATE.
AD-619 542 DIV. 25

SEMICONDUCTORS
ELECTRICAL AND ELECTRO-OPTICAL PROPERTIES OF INTERFACE ALLOY HETEROJUNCTIONS.
AD-619 320 DIV. 25

SOAPS
REPRINT: SOAP FILMS AND SOME PROBLEMS IN SURFACE AND COLLOID CHEMISTRY.
AD-619 293 DIV. 4

•SURFACES
SCATTERING
MOLECULAR BEAM VELOCITY DISTRIBUTION MEASUREMENTS.
AD-619 230 DIV. 9

•SURVIVAL
PROTECTIVE CLOTHING
REVIEW OF CURRENT CONCEPTS AND PRACTICES USED TO CONTROL BODY HEAT LOSS DURING WATER IMMERSION.
AD-619 241 DIV. 16

•SWITCHING CIRCUITS
SYNTHESIS
REPRINT: ANALYSIS AND SYNTHESIS OF STABLE LINEAR SEQUENTIAL CIRCUITS.
AD-619 169 DIV. 30

•SYMPOSIA
MONITORS
PROCEEDINGS OF THE SYMPOSIUM ON REMOTE SENSING OF ENVIRONMENT (3RD), 14-16 OCTOBER 1964.
AD-619 032 DIV. 30

•S-MATRIX
RESONANCE SCATTERING
REPRINT: SCATTERING MATRIX APPROACH TO THE LAMBDA HYPERON-PION RESONANCE.
AD-619 374 DIV. 20

•TABLES
ASTROPHYSICS
TABLE OF HARTREE-FOCK SELF CONSISTENT FIELD WAVE FUNCTIONS WITH EXCHANGE.
AD-619 428 DIV. 2

•TARGETS
PENETRATION
STRESS WAVES IN BOUNDED MEDIA RESULTING PRIMARILY FROM EXPLOSIONS AND/OR PROJECTILE IMPACT.
AD-613 935 DIV. 22

•TEETH
DISEASES
REPRINT: PAROTID FLUID FLOW RATE, PAROTID FLUID, AND SERUM INORGANIC PHOSPHATE CONCENTRATIONS AS RELATED TO DENTAL CARIES STATUS IN MAN.
AD-619 334 DIV. 16

FLUORESCENCE
REPRINT: CHARACTERISTICS OF INSOLUBLE PROTEIN OF TOOTH AND BONE I. FLUORESCENCE OF SOME ACIDIC HYDROLYTIC FRAGMENTS.
AD-619 211 DIV. 16

•TELEMETER SYSTEMS
MAGNETIC RECORDING SYSTEMS
SATELLITE CONTROL FACILITY, DESIGN CRITERIA: EXTENDING THE FREQUENCY RESPONSE OF THE REMOTE STATION TAPE RECORDER/REPRODUCER EQUIPMENT.
AD-619 003 DIV. 12

•TELEPHONE COMMUNICATION SYSTEMS
DATA TRANSMISSION SYSTEMS
IMPULSE NOISE AND ERROR PERFORMANCE IN DATA TRANSMISSION IN TELEPHONE COMMUNICATION SYSTEMS.
AD-619 416 DIV. 5

DIGITAL SYSTEMS
DIGITAL COMMUNICATION OVER FIXED TIME-CONTINUOUS CHANNELS WITH MEMORY, WITH SPECIAL APPLICATION TO TELEPHONE CHANNELS.
AD-619 110 DIV. 8

•TELESCOPES
ASTRONOMICAL DATA
RELATIVE ADVANTAGES OF INTERFEROMETER OVER TELESCOPE FOR MEASURING SOURCE SIZES.
AD-619 248 DIV. 30

•TELETYPE SYSTEMS
DIGITAL COMPUTERS
SATELLITE CONTROL FACILITY, DESIGN CRITERIA: DIRECT CONNECTION FOR CDC-160A COMPUTER TO TELETYPE TRANSMISSION LINES.
AD-619 002 DIV. 12

•TELEVISION COMMUNICATION SYSTEMS
INFRARED PHOTOGRAPHY
TRANSLATION OF RUSSIAN RESEARCH: EXPERIMENTS IN TELEVISION PHOTOGRAPHY OF THE MOON IN THE 0.8-1.1 AND 0.8-2.2 MICRON RANGE.
AD-619 395 DIV. 2

•TELLURIUM ALLOYS
CADMIUM ALLOYS
REPRINT: PARTIAL PRESSURES AND GIBBS FREE ENERGY OF FORMATION FOR CONGRUENTLY SUBLIMING CDTE(C).
AD-619 292 DIV. 25

MERCURY ALLOYS
REPRINT: ELASTIC CONSTANTS OF HGTE.
AD-619 308 DIV. 25

PALLADIUM ALLOYS
REPRINT: CONSTITUTION AND MAGNETIC AND ELECTRICAL PROPERTIES OF PALLADIUM TELLURIDES (PDTE-PDTE2).
AD-619 519 DIV. 17

•TEMPERATURE CONTROL
QUARTZ RESONATORS
HIGH PRECISION 5 MC QUARTZ RESONATORS FOR TEMPERATURE CONTROL BETWEEN 20 AND 30 C.
AD-619 433 DIV. 8
HIGH PRECISION 5 MC QUARTZ RESONATORS FOR TEMPERATURE CONTROL BETWEEN 20 AND 30 C.
AD-619 434 DIV. 8

•TERRESTRIAL MAGNETISM
ATLANTIC OCEAN
STUDY OF AEROMAGNETIC DATA, NEW ENGLAND SEAMOUNT AREA.
AD-619 117 DIV. 2

HYDROGRAPHIC SURVEYING

GEOMAGNETIC SURVEY INFORMATION.
AD-614 049 DIV. 2

IONOSPHERIC PROPAGATION
RESULTS OF SIMULTANEOUS FLF MEASUREMENTS AT BRANNENBURG, GERMANY AND KINGSTON, R. I.
AD-614 012 DIV. 2

MAPPING
GEOGRAPHIC CHARTS AND ALTITUDE PLOTS FOR SELECTED VALUES OF GEOMAGNETIC SHELL PARAMETERS B AND L.
AD-614 101 DIV. 2

SURVEYING
WORLD MAGNETIC SURVEY AND THE EARTH'S INTERIOR.
AD-614 409 DIV. 2

•TEST EQUIPMENT
UNDERWATER SOUND
PORTSMOUTH NAVAL SHIPYARD FACILITIES FOR NOISE MEASUREMENT AND REDUCTION.
AD-614 126 DIV. 21

•TEST EQUIPMENT (ELECTRONICS)
PROGRAMMING (COMPUTERS)
COMPUTER ALGORITHM FOR FAULT ISOLATION AND TEST POINT SELECTION.
AD-613 960 DIV. 8

•TEST METHODS
BEAMS (STRUCTURAL)
SLOW BEND-TENSION TEST CORRELATIONS OF SHORT BEAMS WITH SPECIAL REFERENCE TO THE CHARPY-TYPE SPECIMEN.
AD-614 098 DIV. 30

PHOTOELASTICITY
TRANSLATION OF FRENCH RESEARCH. PHOTOELASTICITY: PRINCIPLES, METHODS AND APPLICATIONS TO MATERIALS TESTING, METALLURGY AND MECHANICS, PARTS I, II, III.
AD-614 282 DIV. 30

•TEST REACTORS
HEAT TRANSFER
THERMAL RESPONSE OF AEROSPACE SHIELD TEST REACTOR TO LOSS OF COOLANT.
AD-614 452 DIV. 20

•THERMAL CONDUCTIVITY
LIQUIDS
REACTION KINETICS, THE THEORY OF LIQUIDS, AND OPTICAL ROTATION.
AD-614 083 DIV. 4

SUPERCONDUCTORS
REPRINT: EFFECT OF MAGNETIC FIELD ON THERMAL CONDUCTIVITY AND ENERGY GAP OF SUPERCONDUCTING FILMS.
AD-614 369 DIV. 25

•THERMAL DIFFUSION
MEASUREMENT
METHOD OF MEASURING THERMAL DIFFUSIVITY OF POORLY CONDUCTIVE MATERIALS WITH SPECIAL REFERENCE TO AMMONIUM PERCHLORATE.
AD-614 081 DIV. 25

TEST METHODS
RAPID MEASUREMENT OF THERMAL DIFFUSIVITY AT ELEVATED TEMPERATURES WITH AN APPLICATION TO A SANDWICH STRUCTURE.
AD-614 034 DIV. 30

•THERMAL NEUTRONS
SHIELDING
TECHNIQUES FOR MEASURING EFFECTS OF NUCLEAR RADIATION ON MATERIALS AND COMPONENTS.
AD-614 109 DIV. 16

•THERMAL RADIATION
FOREST FIRES
PROBABILITY OF EFFECTIVE POST-ATTACK FIRE FIGHTING IN WILDLANDS.
AD-614 488 DIV. 13

RESONATORS
RESONANCES IN THE SPECTRAL ENERGY DENSITY OF THERMAL FIELDS AND SPONTANEOUS EMISSION.
AD-614 061 DIV. 25

•THERMODYNAMICS
ALIPHATIC COMPOUNDS
REPRINT: EXCESS THERMODYNAMIC FUNCTIONS FOR LIQUID MIXTURES OF METHANEPROPANE.
AD-614 517 DIV. 4

STATISTICAL MECHANICS
REPRINT: GIBBS' THIRD VARIATIONAL PRINCIPLE IN STATISTICAL THERMODYNAMICS.
AD-614 380 DIV. 25

•THREAT EVALUATION
PUBLIC OPINION
THREAT PERCEPTION AND CIVIL DEFENSE.
AD-614 386 DIV. 18

•THROMBOSIS
LUNGS
REPRINT: PULMONARY MICROTHROMBI.
AD-614 349 DIV. 16

•THRUST VECTOR CONTROL SYSTEMS
ROCKETS
EXPERIMENTAL INVESTIGATION OF THE FLOW PHENOMENA INVOLVED IN GASEOUS THRUST DIRECTION CONTROL DEVICES.
AD-614 279 DIV. 27

•THULIUM
EXCITATION
REPRINT: COULOMB EXCITATION OF TM169.
AD-614 209 DIV. 20

•TIDES
NOISE
REPRINT: SOME CHARACTERISTICS OF 25-CPS SHALLOW-WATER AMBIENT NOISE.
AD-614 546 DIV. 2

•TISSUES (BIOLOGY)
CALCIFICATION
REPRINT: PHOSPHORESCENCE OF CALCIFIED TISSUES.
AD-614 210 DIV. 16

PARAMAGNETIC RESONANCE
REPRINTS: ELECTRON SPIN RESONANCE CHARACTERISTICS OF SOME NORMAL TISSUES: EFFECT OF MICROWAVE POWER.
AD-614 343 DIV. 16

ULTRASONIC RADIATION
EFFECT OF ULTRASOUND ON BIOLOGICAL TISSUE.
AD-614 370 DIV. 16

•TITANIUM
CRYSTALS
REPRINT: CALCULATION OF CRYSTAL-FIELD ENERGY-LEVEL SPLITTINGS OF THE TI(3) ION IN RBAL(SO4)2.12H2O.
AD-614 357 DIV. 25

•TITANIUM ALLOYS
OXIDATION
TRANSLATION OF RUSSIAN RESEARCH: INVESTIGATING OXIDATIONS OF NIOBIUM-TITANIUM-ZIRCONIUM ALLOYS.
AD-614 017 DIV. 17

OXIDES
REPRINT: ELECTROCHEMICAL BEHAVIOR OF TIOX SOLID SOLUTIONS IN AQUEOUS HF AND HF-HCL MIXTURES.
AD-614 183 DIV. 4

•TOPOGRAPHIC CAMERAS
CALIBRATION
TRANSLATION OF GERMAN RESEARCH: CALIBRATION OF SURVEY CAMERAS ON THE BASIS OF MODEL DEFORMATIONS.
AD-614 399 DIV. 2

•TOWED BODIES
STABILITY
PROGRAM FOR THE STABILITY ANALYSIS OF A TOWED BODY.
AD-614 102 DIV. 30

•TOXINS AND ANTITOXINS
CLOSTRIDIUM TETANI
REPRINT: ROLE OF GANGLIOSIDE IN THE MODE OF ACTION OF TETANUS TOXIN.
AD-614 202 DIV. 16

TOXICITY
REPRINT: STUDIES ON THE ROLE OF POTASSIUM IONS IN THE LETHAL TOXICITY OF STREPTOLYSIN O.
AD-614 198 DIV. 16

•TRAINING DEVICES
READING
REPRINT: TYPOGRAPHICAL CUING IN CONVENTIONAL AND PROGRAMED TEXTS.
AD-614 317 DIV. 23

TEACHING MACHINES
PROGRAMMING METHOD AND RESPONSE MODE IN A VISUAL ORAL TASK.
AD-614 014 DIV. 28

•TRANSDUCERS
ERRORS
TRANSDUCERS FOR SONIC FATIGUE MEASUREMENTS.
AD-613 946 DIV. 30

•TRANSFORMATIONS (MATHEMATICAL)
MECHANICS
THE GENERALIZATION OF HAMILTON'S MECHANICS. I. THEORY OF HOMOGENEOUS CONTACT TRANSFORMATIONS.
AD-614 029 DIV. 25

•TRANSFORMATIONS (MATHEMATICS)
HAMILTONIAN
REPRINT: UNITARY SYMMETRY AND WEAK INTERACTIONS. II. SU(3) TRANSFORMATION PROPERTIES.
AD-614 154 DIV. 20

•TRANSISTORS
INTEGRATED CIRCUITS
INTEGRATED SILICON DEVICE TECHNOLOGY. VOLUME VI. UNIPOLAR TRANSISTORS.
AD-613 951 DIV. 8

MICROWAVE OSCILLATORS
MICROWAVE SOLID-STATE GENERATORS.
AD-614 047 DIV. 8

PREPARATION
NEW CONCEPTS FOR SOLID STATE MICROWAVE GENERATORS: SURFACE CONTROLLED MICROWAVE

AVALANCHE TRANSISTOR.
AD-619 000 DIV. 8

RADIATION DAMAGE
FIRST TEST ON RADIATION EXPERIMENTATION FOR THE Q-FACTOR TECHNIQUE: BIPOLAR TRANSISTOR GAIN AS A FUNCTION OF NEUTRON EXPOSURE.
AD-619 112 DIV. 8
EVALUATION OF FIELD-EFFECT TRANSISTORS.
AD-619 268 DIV. 8

•TRANSITION ELEMENTS
FERROMAGNETISM
FERROMAGNETISM IN THE TRANSITION METALS.
AD-613 977 DIV. 25

•TRANSITION TEMPERATURE
MAGNETISM
REPRINT: CURIE POINT MEASUREMENT AT HIGH PRESSURE BY A SINGLE COIL TECHNIQUE.
AD-619 322 DIV. 30

•TRANSMISSION LINES
DESIGN
PROPERTIES OF STRIP TRANSMISSION LINE, VOLUME I.
AD-619 035 DIV. 8
PROPERTIES OF STRIP TRANSMISSION LINE, VOLUME II.
AD-619 036 DIV. 8

WAVEGUIDES
FEASIBILITY STUDY ON THE DEVELOPING OF COMPACT COMPONENTS FOR OVERSIZED WAVEGUIDE SYSTEMS.
AD-613 953 DIV. 8

•TRANSPORT PROPERTIES
ELECTRONS
PROPERTIES OF CONDUCTION ELECTRONS IN IONIC CRYSTALS.
AD-619 091 DIV. 25

INTEGRAL EQUATIONS
INVARIANT IMBEDDING AND REFORMULATION OF THE INTERNAL INTENSITY PROBLEM IN TRANSPORT THEORY.
AD-619 031 DIV. 25

•TRANSPORT THEORY
MOLECULES
OCCURRENCE OF BINARY COLLISIONS OF THREE HARD SPHERES IN A MOLECULAR MODEL.
AD-619 294 DIV. 25

•TRAVELING-WAVE TUBES
C-BAND
THREE-WATT LOW-NOISE TRAVELING-WAVE TUBE FOR C-BAND.
AD-619 129 DIV. 8

DESIGN
MEDIUM-POWER, LOW-NOISE TRAVELING WAVE TUBE DEVELOPMENT.
AD-619 469 DIV. 8
MEDIUM-POWER, LOW-NOISE TRAVELING WAVE TUBE DEVELOPMENT.
AD-619 470 DIV. 8

ENVIRONMENTAL TESTS
MEDIUM-POWER LOW-NOISE TRAVELING-WAVE TUBE DEVELOPMENT.
AD-619 222 DIV. 8

•TREMATODES
PHILIPPINES
REPRINT: A MONOGENETIC AND SEVEN DIGENETIC TREMATODES OF AMPHIBIANS AND REPTILES FROM PALAWAN ISLAND, PHILIPPINES.
AD-619 302 DIV. 16

•TROPOSPHERE
RADIO TRANSMISSION
RADIO PROPAGATION IN TROPOSPHERIC TRADEWIND DUCTING.
AD-619 240 DIV. 8

•TUNGSTEN
ADSORPTION
REPRINT: THERMAL DESORPTION OF SR FROM W.
AD-619 142 DIV. 25

DEFORMATION
INVESTIGATION OF BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
AD-613 969 DIV. 17
BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
AD-619 086 DIV. 17
BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
AD-619 128 DIV. 17
BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
AD-619 129 DIV. 17
BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
AD-619 236 DIV. 17

•TUNNELING (ELECTRONICS)
CADMIUM COMPOUNDS
REPRINT: TUNNELING PROCESSES ACROSS THE CDS-ELECTROLYTE INTERFACE.
AD-619 494 DIV. 25

•TURBULENCE
LOW ALTITUDE
ENVIRONMENTAL CONDITIONS TO BE CONSIDERED IN THE STRUCTURAL DESIGN OF AIRCRAFT REQUIRED TO OPERATE AT LOW LEVELS.
AD-619 460 DIV. 1

•ULTRASONIC RADIATION
NON-DESTRUCTIVE TESTING
ULTRASONIC SPECTROSCOPY OF STEEL.
AD-619 113 DIV. 26
REPRINT: TRANSLATION OF CANADIAN RESEARCH. ULTRASONIC METHOD FOR EVALUATING BONDS IN LARGE METALLIC BEARINGS.
AD-619 307 DIV. 26
TRANSLATION OF RUSSIAN PATENT: ULTRASONIC FLAW DETECTOR.
AD-619 397 DIV. 30

TISSUES (BIOLOGY)
EFFECT OF ULTRASOUND ON BIOLOGICAL TISSUE.
AD-619 370 DIV. 16

WELDING
ULTRASONIC WELDING PROCESS AND EQUIPMENT FOR CONSTRUCTION OF ELECTRON-TUBE MOUNTS.
AD-619 450 DIV. 26

•ULTRAVIOLET SPECTROSCOPY
ATMOSPHERE MODELS
COMPARISON BETWEEN MODEL ATMOSPHERES AND SPECTRA FROM EARLY-TYPE STARS.
AD-619 523 DIV. 2

•UNDERGROUND EXPLOSIONS
CIVIL ENGINEERING
TRANSLATION OF RUSSIAN RESEARCH: CALCULATION OF CHARGES DURING MASSIVE EXPLOSIONS FOR THROWING-OUT, 2 ED. REV.
AD-613 987 DIV. 13

•UNDERGROUND STRUCTURES
HYDRAULIC ACCUMULATORS
THE EFFECTS OF FLUID RESONANCE ON THE BOUNDARY STRESSES OF A FLUID-FILLED CAVITY.
AD-619 418 DIV. 13

•UNDERWATER CLOTHING
THERMAL INSULATION
REVIEW OF CURRENT CONCEPTS AND PRACTICES USED TO CONTROL BODY HEAT LOSS DURING WATER IMMERSION.
AD-619 241 DIV. 16

•UNDERWATER SOUND
SUBMARINES
PORTSMOUTH NAVAL SHIPYARD FACILITIES FOR NOISE MEASUREMENT AND REDUCTION.
AD-619 126 DIV. 31

•UPPER ATMOSPHERE
COSMIC RAYS
REPRINT: COSMIC-RAY HEAVY NUCLEI AT THE GEOMAGNETIC EQUATOR.
AD-619 549 DIV. 20

•URBAN PLANNING
MATHEMATICAL MODELS
ON COMPUTER MODELS AND URBAN PLANNING.
AD-619 413 DIV. 30

•VANADIUM COMPOUNDS
MAGNETIC PROPERTIES
REPRINT: MAGNETIC PROPERTIES OF V(3) IONS IN CUBIC SPINELS.
AD-619 319 DIV. 25

•VARIABLE STARS
OPTICAL ANALYSIS
REPRINT: MULTICOLOR PHOTOMETRY OF CARBON STARS.
AD-619 361 DIV. 2

•VASOACTIVE AGENTS
PITUITARY HORMONES
SMOOTH MUSCLE RESPONSES AS ALTERED BY HUMORAL BACK GROUND.
AD-619 478 DIV. 16

•VEGETABLE OILS
MELANESIA
REPRINT: COMPONENTS OF THE OIL OF ARAUCARIA.
AD-619 524 DIV. 4

•VELOCITY
MOLECULAR BEAMS
MOLECULAR BEAM VELOCITY DISTRIBUTION MEASUREMENTS.
AD-619 230 DIV. 9

SELECTION
REPRINT: THE RESOLUTION FUNCTION OF A TWO-ROTOR NEUTRON VELOCITY SELECTOR.
AD-619 221 DIV. 20

•VERY HIGH FREQUENCY
AIR TRAFFIC CONTROL SYSTEMS
COMPARISON OF TWO VHF COMMUNICATION FREQUENCY ASSIGNMENT METHODS.
AD-619 443 DIV. 19

•VIBRATION
METHANE
REPRINT: ANHARMONICITY CORRECTION FOR POLYATOMIC MOLECULES. PART II. METHANE.
AD-619 088 DIV. 25

•VIDEO SIGNALS
AUTOMATIC GAIN CONTROL
SILICON P-N JUNCTIONS AS AUTOMATIC GAIN CONTROL (AGC) ELEMENTS FOR VIDEO PULSES.
AD-619 280 DIV. 8

•VINYL PLASTICS
ORGANIC COATINGS
REPRINT: PROBLEMS OF ADHESION WITH CATHODIC PROTECTION.
AD-619 551 DIV. 4

•VIRUS DISEASES
RESPIRATORY SYSTEM
REPRINT: RELATIONSHIP OF RHINOVIRUS INFECTION TO MILD UPPER RESPIRATORY DISEASE. II. EPIDEMIOLOGIC OBSERVATIONS IN MALE MILITARY TRAINEES.
AD-619 309 DIV. 16

•VISCOELASTICITY
SPHERES
COMPLEX POISSON'S RATIO AND DILATATION CONSTANTS FROM FORCED VIBRATION OF A SPHERE.
AD-619 461 DIV. 25

•VISION
CATS
CODING AND TRANSMISSION IN THE VISUAL SYSTEM.
AD-619 486 DIV. 16

•VISUAL ACUITY
THEORY
REPRINT: VISUAL ACUITY.
AD-619 178 DIV. 16

•VISUAL PERCEPTION
COLOR VISION
REPRINT: MAINTAINING AN ABSOLUTE HUE IN THE PRESENCE OF DIFFERENT BACKGROUND COLORS.
AD-619 199 DIV. 16

PROJECTIVE GEOMETRY
REPRINT: DESARGUESIAN PROPERTY IN VISUAL SPACE.
AD-619 364 DIV. 28

•VORTICES
SHOCK WAVES
REPRINT: INTERACTION OF A STARTING VORTEX AS WELL AS A VORTEX STREET WITH A TRAVELING SHOCK WAVE.
AD-619 311 DIV. 9

•WEIGHTLESSNESS
MONITORS
MECHANICAL DEVICE FOR SENSING ZERO G OR WEIGHTLESSNESS.
AD-613 937 DIV. 22

•WELDING
ULTRASONIC RADIATION
ULTRASONIC WELDING PROCESS AND EQUIPMENT FOR CONSTRUCTION OF ELECTRON-TUBE MOUNTS.

•WAKE
TEMPERATURE
EXPERIMENTAL STUDY OF LAMINAR NEAR WAKES.
AD-619 004 DIV. 9

•WATER WAVES
MATHEMATICAL ANALYSIS
CLASS OF MULTIPLE INTEGRALS OF THE STATIONARY PHASE TYPE OCCURRING IN THE THEORY OF WATER WAVES.
AD-613 973 DIV. 9

•WAVEGUIDES
DESIGN
FEASIBILITY STUDY ON THE DEVELOPING OF COMPACT COMPONENTS FOR OVERSIZED WAVEGUIDE SYSTEMS.
AD-613 953 DIV. 8

•WEAPON SYSTEMS
METEOROLOGY
SOURCES OF METEOROLOGICAL DATA FOR WEAPONS SYSTEMS STUDIES.
AD-619 262 DIV. 22

AD-619 450 DIV. 26

•WELDS
NON-DESTRUCTIVE TESTING
TRANSLATION OF RUSSIAN PATENT: ULTRASONIC FLAW DETECTOR.
AD-619 397 DIV. 30

•WELL LOGGING
INSTRUMENTATION
REPRINT: A CORE ALIGNER DESIGNED TO RECOVER ORIENTED RECENT MARINE CORES.
AD-619 331 DIV. 2

•WIRE
ANTENNAS
ANTENNA WIRE SAG AND TENSION CALCULATIONS.
AD-619 075 DIV. 8

•X-RAY DIFFRACTION ANALYSIS
CRYSTAL STRUCTURE
ANALOG COMPUTERS FOR X-RAY CRYSTAL ANALYSIS.
AD-613 925 DIV. 30

•X-RAY PHOTOGRAPHY
ALLOYS
TRANSLATION OF RUSSIAN RESEARCH: X-RAY EXAMINATION OF THE ORDERING PROCESS IN ALLOYS.
AD-619 387 DIV. 17

•YTTERIUM
MANGANESE ALLOYS
INVESTIGATIONS OF THE SYSTEMS Y-MN, GD-MN AND SM-MN.
AD-619 462 DIV. 17

•YTTRIUM COMPOUNDS
FERRITES
DETERMINATION OF THE CRYSTAL STRUCTURE OF YTTRIUM ORTHOFERRITE AND REFINEMENT OF GADOLINIUM ORTHOFERRITE.
AD-619 495 DIV. 25

•ZINC
ELECTRODES
ZINC ELECTRODES FOR LONG LIFE, LIGHT WEIGHT SILVER OXIDEZINC SECONDARY BATTERIES.
AD-619 119 DIV. 7

•ZINC ALLOYS
ATOMIC ENERGY LEVELS
ELECTRONIC STRUCTURE OF DILUTE SOLID SOLUTION ALLOYS OF 3DTRANSITION METALS IN A NON-MAGNETIC MATRIX.
AD-619 482 DIV. 25

•ZIRCONIUM
OXIDATION
REPRINT: PARABOLIC OXIDATION KINETICS OF BETA-ZIRCONIUM.
AD-619 556 DIV. 17

•ZIRCONIUM ALLOYS
OXIDATION
TRANSLATION OF RUSSIAN RESEARCH: INVESTIGATING OXIDATIONS OF NIOBIUM-TITANIUM-ZIRCONIUM ALLOYS.
AD-619 017 DIV. 17

PERSONAL AUTHOR INDEX

•AARONS, JULES
• • •
IONOSPHERIC AND TROPOSPHERIC SCINTILLATIONS OF A RADIO STAR AT ZERO TO FIVE DEGREES OF ELEVATION.
AD-614 161 DIV. 2

•ABBOTT, KENNETH H.
• • •
THE USE OF THE CRITICAL THICKNESS CONCEPT IN DESIGN
AD-614 094 DIV. 27

•ABBOTT, PHILLIP A.
• • •
EFFECTS OF BOUNDARY FRICTION ON TRANSMISSION OF STATIC STRESS THROUGH AND IN CYLINDRICAL TANKS.
AD-614 108 DIV. 13

•ACKERBERG, ROBERT C.
• • •
THE VISCOUS INCOMPRESSIBLE FLOW INSIDE A CONE,
AD-614 492 DIV. 9

•ADAMS, HENRY , III
• • •
COASTAL STORMS OF THE EASTERN UNITED STATES,
AD-614 189 DIV. 2

•ADAMS, N. I.
• • •
TUNABLE COHERENT LIGHT SOURCE.
AD-613 968 DIV. 25

•ADAMS, RALPH N.
• • •
CORRELATION OF SOLVENT EFFECTS ON ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF THE NITRO BENZENE ANION RADICAL,
AD-613 924 DIV. 4
• • •
OPERATIONAL AMPLIFIER CIRCUITS FOR CONTROLLED POTENTIAL CYCLIC VOLTAMMETRY, II,
AD-614 195 DIV. 4
• • •
VOLTAMMETRY AND ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF HALONITROBENZENE ANION RADICALS,
AD-614 291 DIV. 4
• • •
APPLICATION OF ELECTRON PARAMAGNETIC RESONANCE TECHNIQUES IN ELECTROCHEMISTRY,
AD-614 538 DIV. 4

•ADAMS, RICHARD H.
• • •
RESEARCH OF AERODYNAMIC METHODS OF PRODUCING ANTENNA WINDOWS IN A PLASMA SHEATH.
AD-614 084 DIV. 8

•AGGARWAL, R. L.
• • •
EFFECT OF UNIAXIAL STRESS ON THE EXCITATION SPECTRA OF DONORS IN SILICON,
AD-614 529 DIV. 25

•AGOSTA, VITO D.
• • •
SHOCK-WAVE PROPAGATION IN LIQUID PROPELLANT ROCKET ENGINES.
AD-614 201 DIV. 27

•AHEARN, PAUL J.
• • •
HOMOGENIZATION OF HIGH-STRENGTH STEEL AT 2500 F,
AD-614 277 DIV. 26

•AI, D. K.
• • •
A CLASS OF MULTIPLE INTEGRALS OF THE STATIONARY PHASE TYPE OCCURRING IN THE THEORY OF WATER WAVES,
AD-613 973 DIV. 9

•AKITA, MUNEHIRA
• • •
MAINTAINING AN ABSOLUTE HUE IN THE PRESENCE OF DIFFERENT BACKGROUND COLORS,
AD-614 199 DIV. 16

•AKITT, DONALD P.
• • •
MILLIMETER WAVE GENERATION BY MULTIPLE QUANTUM CONVERSION.
AD-614 092 DIV. 8

•ALBE-FESSARD, D.
• • •
EVOKED ACTIVITY IN THE CAUDATE NUCLEUS OF THE CAT IN RESPONSE TO VARIOUS KINDS OF AFFERENT STIMULI. I. MACROPHYSIOLOGICAL STUDY (ACTIVITES EVOQUEES DANS LE NOYAU CAUDE DU CHAT EN REPONSE A DES TYPES DIVERS D'AFFERENCES. I. ETUDE MACROPHYSIOLOGIQUE,
AD-614 510 DIV. 16

•ALDEN, JOHN R.
• • •
OPERATIONAL AMPLIFIER CIRCUITS FOR CONTROLLED POTENTIAL CYCLIC VOLTAMMETRY, II,
AD-614 195 DIV. 4

•ALEKSANDROV, I.
• • •
CHEMICAL WEAPONS,
AD-614 392 DIV. 3

•ALEXANDER, B. H.
• • •
SYNTHESIS OF ETHYL P-NITROPHENYL ALPHAMETHOXYALKYL-PHOSPHONATES,
AD-614 350 DIV. 4

•ALLEN, GEORGE H.
• • •
THE ELECTRONIC SYSTEMS DIVISION. RELIABILITY/MAINTAINABILITY PROGRAM ELEMENTS,
AD-614 423 DIV. 18

•ALMGREN, D. W.
• • •
THE PRODUCTION OF INTENSE MAGNETIC FIELDS BY MEANS OF LIQUID NITROGEN COOLED COPPER COILS.
AD-613 967 DIV. 25

•ANDERSON, B.
• • •
ABSORPTION OF SIGMA(-) HYPERONS IN PHOTOGRAPHIC EMULSION NUCLEI,
AD-614 213 DIV. 20

•ANDERSON, C. W.
• • •
THERMODYNAMIC PROPERTIES OF AQUEOUS SOLUTIONS OF MIXED ELECTROLYTES. THE HYDROCHLORIC ACID-POTASSIUM CHLORIDE SYSTEM FROM 40 TO 0C,
AD-614 559 DIV. 4

•ANDERTON, W. ARTHUR
• • •
PROBLEMS OF ADHESION WITH CATHODIC PROTECTION,
AD-614 551 DIV. 4

•ANDRESEN, H. G.
• • •
RESONANT FREQUENCY MIXING EFFECTS IN DISTRIBUTED MEDIA.
AD-614 208 DIV. 25

•APPOLONOV, G. F.
• • •
THERMOANEMOMETER WITH DC FEEDBACK,
AD-614 020 DIV. 30

•ARENDT, P. R.
• • •
DOWNWARD ELECTRON FLUX AT 1,000 KM ALTITUDE FROM ELECTRON CONTENT MEASUREMENT AT MID-LATITUDES,
AD-614 203 DIV. 2

•ARKILIC, G. M.
• • •
STUDIES IN THE THEORY OF A DISLOCATED CONTINUUM.
AD-614 225 DIV. 25

•ARTISS, KENNETH L.
• • •
MODES OF COMMUNICATION USED BY MILITARY PATIENTS DIAGNOSED AS SCHIZOPHRENIC (ACUTE), AS ALCOHOLIC (CHRONIC) AND BY MILITARY OFFENDERS (AWOL),
AD-614 562 DIV. 28

•ASTHOLZ, PAUL T.
• • •
COMPARISON OF TWO VHF COMMUNICATION FREQUENCY ASSIGNMENT METHODS,
AD-614 443 DIV. 19

•AUGUSTYNIAK, J. Z.
• • •
N-ACETYL GROUPS IN VITELLENIN
AD-614 514 DIV. 16

•AUSTIN, WILLIAM H. , JR.
• • •
ENVIRONMENTAL CONDITIONS TO BE CONSIDERED IN THE STRUCTURAL DESIGN OF AIRCRAFT REQUIRED TO OPERATE AT LOW LEVELS.
AD-614 460 DIV. 1

•AVRETT, E. H.
• • •
COMPARISON BETWEEN MODEL ATMOSPHERES AND SPECTRA FROM EARLY-TYPE STARS,
AD-614 523 DIV. 2

•AZARRAGA, L.
• • •
PHOTOCONDUCTIVITY OF ANTHRACENE,
AD-614 197 DIV. 25

•BACHYNSKI, M. P.
• • •
ELECTROMAGNETIC WAVE PROPAGATION IN ANISOTROPIC PLASMAS ALONG THE DIRECTION OF A STATIC MAGNETIC FIELD
AD-614 442 DIV. 25

•BAHCALL, J. N.
• • •
NEUTRINO-SPECTROSCOPY OF THE SOLAR INTERIOR,
AD-614 323 DIV. 2

•BAILEY, ROBERT E.
• • •
A NOVEL REARRANGEMENT OF 1,2-BIS (TRIMETHYLSILYL)-HYDRAZINE,
AD-614 290 DIV. 4

•BAIRD, R. C.
• • •
THE INTERACTIONS OF 14.6-

MEV NEUTRONS IN IRON, LITHIUM-7, AND CARBON.
AD-614 451 DIV. 20

•BALABAN, HAROLD
• • •
SYSTEM RELIABILITY PREDICTION BY FUNCTION,
AD-614 227 DIV. 8

•BALIGA, B. T.
• • •
EFFECT OF PRESSURE ON THE HYDROLYSIS OF METHYL ACETATE AND ETHYLENE OXIDE IN ACETONE + WATER MIXTURES: QUANTITIES OF ACTIVATION AT CONSTANT VOLUME, AND THE ISOKINETIC PRESSURE,
AD-614 516 DIV. 4

•BANKS, E.
• • •
POLYMORPHISM OF RARE EARTH DISILICIDES,
AD-614 137 DIV. 25

•BANTHORPE, D. V.
• • •
THE REARRANGEMENT OF AROMATIC N-NITROAMINES. PART III. THE ACID-CATALYSED REARRANGEMENT OF N-NITROANILINE,
AD-614 219 DIV. 4

•BARLOW, RICHARD E.
• • •
NONPARAMETRIC LIFE TEST SAMPLING PLANS,
AD-614 490 DIV. 15

•BARNES, CLIFFORD A.
• • •
PHYSICAL AND CHEMICAL DATA FOR PUGET SOUND AND APPROACHES, SEPTEMBER 1956DECEMBER 1957,
AD-614 499 DIV. 2

•BARONE, STEPHEN R.
• • •
RESONANCES IN THE SPECTRAL ENERGY DENSITY OF THERMAL FIELDS AND SPONTANEOUS EMISSION
AD-614 061 DIV. 25
• • •
FABRY-PEROT RESONANCES AT SMALL FRESNEL NUMBERS,
AD-614 063 DIV. 25

•BARRY, KEVIN G.
• • •
THAM DIALYSIS: AN EXPERIMENTAL METHOD TO STUDY DIFFUSION OF CERTAIN WEAK ACIDS IN VIVO. II. SECOBARBITAL,
AD-614 359 DIV. 16

•BARTEL, ELDER H.
• • •
CHAR DEPTH IN NOZZLE INSERTS,
AD-614 260 DIV. 27

•BARTLETT, H. E.
• • •
STUDY OF SPECIAL BEAMSHAPING ANTENNAS.
AD-613 932 DIV. 8

•BARTLETT, R. W.
• • •
ESTIMATING METAL PARTICLE COMBUSTION KINETICS,
AD-614 563 DIV. 10

•BARUT, A. O.
• • •
NATURE OF THE RESONANCE IN THE STATIC PION-NUCLEON SCATTERING IN ONE-MESON APPROXIMATION,
AD-613 934 DIV. 20

•BAUER, S. H.
• • •
VIBRATIONAL EXCITATION IN SOME FOUR-CENTER TRANSITION STATES,
AD-614 548 DIV. 4

•BAYLESS, THEODORE H.
• • •
THE IMPORTANCE AND RELIABILITY OF THE ROENTGENOGRAPHIC EXAMINATION OF THE SMALL BOWEL IN PATIENTS WITH TROPICAL SPRUE,
AD-613 918 DIV. 16

•BAYLEY, C. H.
• • •
THE EFFECT OF NONCELLULOSIC MATERIAL ON THE ACTINIC DEGRADATION OF COTTON FABRIC. PART II: COPPER OXINATE AND NICKEL OXINATE,
AD-614 499 DIV. 14

•BECKER, KARL R.
• • •
STRESS WAVES IN BOUNDED MEDIA.
AD-613 935 DIV. 22

•BECKMAN, E. L.
• • •
A REVIEW OF CURRENT CONCEPTS AND PRACTICES USED TO CONTROL BODY HEAT LOSS DURING WATER IMMERSION,
AD-614 241 DIV. 16

•BEEBY, J. L.
• • •
FERROMAGNETISM IN THE TRANSITION METALS,
AD-613 977 DIV. 25

•BEISSNER, R. E.
• • •
FORMULATION OF RADIATION TRANSPORT SOLUTIONS FOR SHIELDING APPLICATIONS, INCLUDING INTEGRAL TRANSFORM METHODS, MATRIX TECHNIQUES, AND ASYMPTOTIC APPROXIMATIONS.
AD-614 250 DIV. 20

•BELL, J. R.
• • •
DEVELOPMENT AND APPLICATION OF NUCLEAR MEASUREMENT TECHNIQUES.
AD-614 109 DIV. 16

•BELLANTI, JOSEPH A.
• • •
THE NATURE OF ANTIBODIES FOLLOWING EXPERIMENTAL ARBOVIRUS INFECTION IN GUINEA PIGS,
AD-614 348 DIV. 16

•BELLMAN, R. E.
• • •
INVARIANT IMBEDDING AND A REFORMULATION OF THE INTERNAL INTENSITY PROBLEM IN TRANSPORT THEORY,
AD-614 031 DIV. 25

•BELYAEV, YU. N.
• • •
OBTAINING INTENSIVE MOLECULAR BEAM,
AD-614 393 DIV. 30

•BENNETT, HERBERT S.
• • •
FARADAY EFFECT IN SOLIDS
AD-614 558 DIV. 25

•BENNETT, S. L.
• • •
PHYSICAL PROPERTIES OF ALPHA AND GAMMA ARSENIC,
AD-614 506 DIV. 17

•BENNETT, W. R., JR.
• • •
A QUANTUM MECHANICAL EVALUATION OF LINE BREADTHS INVOLVED IN TUNED-LASER ABSORPTION AND STIMULATED EMISSION SPECTROSCOPY,
AD-614 383 DIV. 25

•BENNING, C. J.
• • •
INVESTIGATION OF THE STATISTICS OF BREAKDOWN USING NANOSECOND PULSE TECHNIQUES,
AD-614 286 DIV. 2

•BERGER, STANLEY A.
• • •
THE FLOW OF A CONDUCTING GAS JET WITH ALIGNED MAGNETIC FIELD,
AD-614 420 DIV. 25

•BERNSTEIN, H. J.
• • •
A SIMPLIFIED PROCEDURE FOR THE ANALYSIS OF COMPLEX NUCLEAR MAGNETIC RESONANCE SPECTRA. II. THE ANALYSIS OF SYMMETRICAL TRIFLUOROBENZENE, THE AA'A''XX'X'' SYSTEM,
AD-614 507 DIV. 20

•BIONDI, MANFRED A.
• • •
ELECTRON-ION RECOMBINATION IN NITROGEN,
AD-614 160 DIV. 2

•BIRCHER, R.
• • •
STUDIES ON THE ROLE OF POTASSIUM IONS IN THE LETHAL TOXICITY OF STREPTOLYSIN O
AD-614 198 DIV. 16

•BIRD, G. A.
• • •
THE PROPAGATION OF ACOUSTIC WAVES THROUGH THE SOLAR CHROMOSPHERE.
AD-613 914 DIV. 2

•BLANCHARD, GORDON C.
• • •
COMPREHENSIVE BIBLIOGRAPHY FOR MECHANISM OF MICROBIOLOGICAL CONTAMINATION OF JET FUEL AND DEVELOPMENT OF TECHNIQUES FOR DETECTION OF MICROBIOLOGICAL CONTAMINATION, APPENDIX C.
AD-614 133 DIV. 10

•BLATT, S. L.
• • •
RADIATIVE CAPTURE OF HE3 BY LI7,
AD-614 515 DIV. 20

•BLOEMBERGEN, N.
• • •
VERY LOW FREQUENCY PROPAGATION; ELECTRON AND SOLID STATE PHYSICS; AUTOMATIC CONTROL; COMMUNICATIONS AND NETWORKS; ELECTROMAGNETIC RADIATION.
AD-614 130 DIV. 30

•BLOOM, H. H.
• • •
RELATIONSHIP OF RHINOVIRUS INFECTION TO MILD UPPER RESPIRATORY DISEASE. II. EPIDEMIOLOGIC OBSERVATIONS IN MALE MILITARY TRAINEES.
AD-614 305 DIV. 16
• • •
PATTERNS OF ADENOVIRUS INFECTIONS IN MARINE CORPS PERSONNEL. I. A 42-MONTH

SURVEY IN RECRUIT AND NON-RECRUIT POPULATIONS. II. LONGITUDINAL STUDY OF SUCCESSIVE ADVANCED RECRUIT TRAINING COMPANIES.
AD-614 306 DIV. 16

•BLUM, MARVIN
• • •
A STATISTICAL ANALYSIS OF PHASE ERRORS AND PHASE DIFFERENCE ERRORS DUE TO THE ATMOSPHERE IN THE OBSERVATIONS OF THE RADAR RETURN FROM A SATELLITE,
AD-614 414 DIV. 6

•BLUMBERG, DONALD F.
• • •
THE EVALUATION OF TECHNIQUES AND DEVICES AS APPLIED TO PROBLEM SOLVING.
AD-614 228 DIV. 30

•BLYUMIN, H. A.
• • •
USE OF TRANSPARENT PLASTICS IN STEREOTOPOGRAPHIC WORK
AD-614 106 DIV. 2

•BORROW, L. S.
• • •
A NOTE ON ACTIVE RC REALI ZATION OF VOLTAGE TRANSFER FUNCTIONS.
AD-614 554 DIV. 8

•BOER, K. W.
• • •
ELECTRO-OPTICAL METHOD FOR INVESTIGATION OF FIELD AND CURRENT DISTRIBUTIONS IN SEMICONDUCTORS AND LAYER-LIKE FIELD DISTRIBUTIONS IN PHOTOCONDUCTORS.
AD-614 439 DIV. 25

•BOGNER, R. S.
• • •
ZINC ELECTRODE INVESTIGATION.
AD-614 119 DIV. 7

•BONHAM, R. A.
• • •
AUTO-AND CROSS-CORRELATION FUNCTIONS USED AS TOOLS FOR INFORMATION RETRIEVAL IN ELECTRON DIFFRACTION STRUCTURE STUDIES
AD-614 534 DIV. 25

•BOPEK, FELIX
• • •
SPECIFICITY OF GUINEA-PIG ANTIBODIES AND DELAYED HYPERSENSITIVITY.
AD-614 179 DIV. 16

•BOWEN, E. D.
• • •
TRADEWIND DUCTING.
AD-614 240 DIV. 8

•BOWERS, R. C.
• • •
REDUCTION OF POLYMERIC FRICTION BY MINOR CONCENTRATIONS OF PARTIALLY FLUORINATED COMPOUNDS.
AD-614 059 DIV. 14

•BOWMAN, R. G.
• • •
RELIABILITY OF INTEGRATED CIRCUITS USED IN MISSILE SYSTEMS
AD-614 103 DIV. 8

•BOYD, WALTER K.
• • •
STRESS-CORROSION CRACKING OF ALUMINUM ALLOYS,
AD-613 957 DIV. 17

•BOYNTON, JAMES
• • •
IDENTIFICATION OF ELEMENTARY AUDITORY DISPLAYS: EFFECT OF UNBALANCED PROBABILITIES OF OCCURRENCE,
AD-614 297 DIV. 8

•BRACKETT, C. A.
• • •
VELOCITY TAPERING IN MICROWAVE AMPLIFIERS.
AD-614 244 DIV. 8

•BRAND, F. A.
• • •
CRITERIA FOR OPTICAL MASER AMPLIFIERS AND OSCILLATORS.
AD-614 209 DIV. 25

•BRAUER, RALPH
• • •
PROCEEDINGS OF THE INTERN ATIONAL SYMPOSIUM ON COLD ACCLIMATION HELD AT INSTITUTO ANTARTICO ARGENTINO, BUENOS AIRES, AUGUST 5-7, 1959.
AD-614 146 DIV. 16

•BREBRICK, R. F.
• • •
PARTIAL PRESSURES AND GIBBS FREE ENERGY OF FORMATION FOR CONGRUENTLY SUBLIMING CDTE(C),
AD-614 292 DIV. 25

•BREED, L. W.
• • •
SYNTHESIS OF ELASTOMERS CONTAINING SI-N BONDS IN THE MAIN CHAIN.
AD-614 473 DIV. 4

•BREIDO, M. I.
• • •
A SELF-ADJUSTING SYSTEM
AD-614 022 DIV. 30

•BREIMAN, L.
• • •
ON RANDOM WALKS WITH AN ABSORBING BARRIER AND GAMBLING SYSTEMS,
AD-614 064 DIV. 19

•BREIMAN, LEO
• • •
CONSISTENT ESTIMATES AND ZERO-ONE SETS.
AD-613 917 DIV. 19

•BREIT, G.
• • •
ANALYSIS OF NUCLEON TRANSFER DATA,
AD-614 089 DIV. 20

•BRETTSCHNEIDER, LAWRENCE
• • •
IMPORTANCE OF PREVENTING RENAL VASCULAR COLLAPSE DURING PERIOD OF RENAL ISCHEMIA IN KIDNEY TRANSPLATATION,
AD-614 298 DIV. 16

•BRIENT, S. J.
• • •
INVESTIGATION OF THE STATISTICS OF BREAKDOWN USING NANOSECOND PULSE TECHNIQUES.
AD-614 286 DIV. 2

•BRIGIDA, G. R.
• • •
COMPUTER ALGORITHM FOR FAULT ISOLATION AND TEST POINT SELECTION.
AD-613 960 DIV. 8

•BRIMHALL, JOHN L.
• • •
INFLUENCE OF A FINELY DISPERSED SECOND PHASE ON RECRYSTALLIZATION.
AD-613 971 DIV. 17
• • •
STRUCTURE OF DEFORMED INTERNALLY OXIDIZED ALLOYS
AD-614 080 DIV. 17

•BROIDA, H. P.
• • •
LASER POSSIBILITIES OF CHEMICALLY EXCITED MOLECULES FORMED WITH ATOMIC SPECIES
AD-614 324 DIV. 25
• • •
INVERTED POPULATION DISTR IBUTIONS PRODUCED BY CHEMICAL REACTIONS,
AD-614 325 DIV. 25
• • •
CHARGE-TRANSFER ABSORPTION SPECTRA OF NO IN KR AND CH3OH SOLUTIONS,
AD-614 552 DIV. 25
• • •
OPTICAL DETECTION OF MICROWAVE TRANSITIONS BETWEEN EXCITED ELECTRONIC STATES OF CN AND THE IDENTIFICATION OF THE TRANSITIONS INVOLVED
AD-614 553 DIV. 25

•BROOKER, E. W.
• • •
A STUDY OF THE BEHAVIOR OF SOIL AND ROCK SUBJECTED TO HIGH STRESS LEVELS.
AD-614 481 DIV. 13

•BROWN, J. E.
• • •
SYNTHESIS OF ETHYL P-NITROPHENYL ALPHAMETHOXYALKYL-PHOSPHONATES,
AD-614 350 DIV. 4

•BROWN, R. HANBURY
• • •
THE STELLAR INTERFEROMETER AT NARRABRI.
AD-614 536 DIV. 2

•BROWN, STEWART A.
• • •
BIOSYNTHESIS OF THE COUMARINS. VI. FURTHER STUDIES ON HERNIARIN FORMATION IN LAVENDER,
AD-614 511 DIV. 16

•BROWN, W. BYERS
• • •
GIBBS' THIRD VARIATIONAL PRINCIPLE IN STATISTICAL THERM ODYNAMICS,
AD-614 380 DIV. 25

•BRUNNER, E. D.
• • •
THE COST OF BASIC RESEARCH EFFORT: AIR FORCE EXPERIENCE, 1954-1964,
AD-614 030 DIV. 30

•BRUNSTEIN, EUGENE
• • •
GROUP SUCCESS AND THE REDUCTION OF STATUS INCONGRUENCE IN TASK-ORIENTED GROUPS,
AD-614 449 DIV. 28

•BRYANT, PAUL J.
• • •
FRICTION AND WEAR BEHAVIOR OF SOLID FILMS.
AD-614 242 DIV. 14

•BUCHANAN, DARRELL S.
• • •
SPONGY DEGENERATION OF THE NERVOUS SYSTEM: A REPORT OF FOUR CASES WITH A REVIEW OF THE LITERATURE.

AD-614 337 DIV. 16

•BUCKENS, F.
• • •
THE SIGNIFICANCE OF SINGULAR CONFIGURATIONS OF STRUCTURES FROM THE STRENGTH OF MATERIALS POINT OF VIEW.
AD-614 341 DIV. 25

•BUFSCHER, E. L.
• • •
EXTENT OF ANTIGENIC VARIATION OF A2 INFLUENZA VIRUSES FROM PROTOTYPE STRAINS.
AD-614 345 DIV. 16

•BUESCHER, EDWARD L.
• • •
THE NATURE OF ANTIBODIES FOLLOWING EXPERIMENTAL ARBOVIRUS INFECTION IN GUINEA PIGS.
AD-614 348 DIV. 16

•BUFFUM, F. G. , JR.
• • •
AN EXPERIMENTAL INVESTIGATION OF THE FLOW PHENOMENA INVOLVED IN GASEOUS THRUST DIRECTION CONTROL DEVICES.
AD-614 279 DIV. 27

•BURBANK, JEANNE
• • •
OXIDES ON THE SILVER ELECTRODE. PART 2. X-RAY DIFFRACTION STUDIES OF THE WORKING SILVER ELECTRODE.
AD-614 058 DIV. 7

•BURDICK, D. C.
• • •
TARGET CAPABILITY VERSUS PRESUMED INTENTION AS A BASIS FOR DECISION IN COMBAT INFORMATION CENTERS.
AD-613 944 DIV. 5

•BURTE, H. M.
• • •
THE INVESTIGATION OF MICROSTRUCTURE IN STRUCTURAL CERAMICS.
AD-614 076 DIV. 14

•BURTSEV, A. I.
• • •
FORMULATION OF TRAJECTORIES OF AIR PARTICLES WITH THE AID OF ELECTRONIC COMPUTERS
AD-614 021 DIV. 2

•BUSER, RUDOLF G.
• • •
DETERMINATION OF RADIAL DISTRIBUTION OF VOLUME RADIANCE OF A LUMINOUS MEDIUM CONFINED IN A GLASS CYLINDER.
AD-614 328 DIV. 25

•BYKHOVSKII, M. L.
• • •
A SELF-ADJUSTING SYSTEM
AD-614 022 DIV. 30

•BYRNE, WILLIAM M. , JR.
• • •
THE EFFECT OF AN INTENSE MAGNETIC FIELD ON ROCKET NOZZLE HEAT TRANSFER. PART 1: THEORY AND SUPERCONDUCTING MAGNET EXPERIMENTS.
AD-613 992 DIV. 27

•CAIRNS, F. V.
• • •
NRC DESIGNS ANTENNA FOR S-BAND BEACON IN SOUNDING ROCKETS. RESONANT SHUNT-FED RADIATOR USES AIR DIELECTRIC TO WITHSTAND HEAT.
AD-614 525 DIV. 8

•CALDWELL, DENNIS
• • •
REACTION KINETICS, THE THEORY OF LIQUIDS, AND OPTICAL ROTATION.
AD-614 083 DIV. 4

•CALDWELL, WILLIAM L.
• • •
THE IMPORTANCE AND RELIABILITY OF THE ROENTGENOGRAPHIC EXAMINATION OF THE SMALL BOWEL IN PATIENTS WITH TROPICAL SPRUE.
AD-613 918 DIV. 16

•CALOGERO, F.
• • •
ASYMPTOTIC BEHAVIOR FOR LARGE IMAGINARY VALUES OF ANGULAR MOMENTUM OF THE AMPLITUDES FOR THE SCATTERING OF A DIRAC PARTICLE ON A CENTRAL SCALAR POTENTIAL.
AD-614 206 DIV. 25

•CAMPBELL, W. S.
• • •
ON THE DESIGN OF A RESISTANCE-CAPACITANCE FILTER FOR USE AT VERY LOW FREQUENCIES.
AD-613 947 DIV. 8

•CAP, F.
• • •
APPLICATION OF VARIATIONAL METHODS FOR THE SOLUTION OF GASDYNAMIC AND MAGNETOGASDYNAMIC PROBLEMS.
AD-614 051 DIV. 25
• • •
SHOCK WAVES.
AD-614 053 DIV. 25

•CAP, FERDINAND
• • •
SOME PRACTICAL EXAMPLES OF ONE DIMENSIONAL UNSTEADY POTENTIAL FLOWS IN MGD.
AD-614 052 DIV. 25

•CARLIN, HERBERT J.
• • •
SINGULAR NETWORK ELEMENTS.
AD-613 919 DIV. 8

•CARR, JEROME B.
• • •
SPACE-TIME VARIABILITY OF THE THERMAL STRUCTURE OF THE UPPER LAYERS OF THE OCEAN.
AD-614 473 DIV. 2

•CARTER, H. G.
• • •
COLD-NEUTRON SCATTERING CROSS SECTION OF LIQUID HYDROGEN BASED ON A CONSISTENTVIBRATIONS LIQUID MODEL.
AD-614 038 DIV. 25
• • •
A CONSISTENT-VIBRATIONS MODEL OF THE INTERNAL DYNAMICS OF LIQUID HYDROGEN.
AD-614 039 DIV. 25

•CARTLEDGE, LINCOLN
• • •
MEASUREMENTS ON AN L-BAND POWER AMPLIFIER FOR PHASED ARRAYS.
AD-614 426 DIV. 8

•CARY, SYLVIA G.
• • •
A FIELD TRIAL OF A NEW TRANSPORT MEDIUM FOR COLLECTION OF FECES FOR BACTERIOLOGIC EXAMINATION.
AD-614 191 DIV. 16

•CASTELLI, JOHN P.
• • •
IONOSPHERIC AND TROPOSPHERIC SCINTILLATIONS OF A RADIO STAR AT ZERO TO FIVE DEGREES OF ELEVATION.
AD-614 161 DIV. 2

•CAWEIN, MADISON
• • •
12 INCH DIAMETER CATHODE RAY TUBE WITH FIBER OPTIC FACEPLATE.
AD-614 448 DIV. 8

•CELLI, V.
• • •
GROUND STATE OF AN ELECTRON GAS IN A MAGNETIC FIELD.
AD-614 254 DIV. 25

•CHABAK, EUGENE J.
• • •
TUNABLE PRESELECTION THROUGH PARAMETRIC CONVERSION
AD-614 027 DIV. 8

•CHADWICK, GEORGE G.
• • •
INVESTIGATION OF A MULTIPLE BEAM SCANNING CIRCULAR ARRAY.
AD-614 288 DIV. 8

•CHAMBERS, JAMES Q.
• • •
OPERATIONAL AMPLIFIER CIRCUITS FOR CONTROLLED POTENTIAL CYCLIC VOLTAMMETRY, II.
AD-614 195 DIV. 4

•CHAMBERS, JAMES Q. , III
• • •
CORRELATION OF SOLVENT EFFECTS ON ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF THE NITRO BENZENE ANION RADICAL.
AD-613 924 DIV. 4

•CHANDLER, CRAIG C.
• • •
PROBABILITY OF EFFECTIVE POST-ATTACK FIRE FIGHTING IN WILDLANDS.
AD-614 488 DIV. 13

•CHANDRASEKHAR, S.
• • •
ON THE OSCILLATIONS OF THE MACLAURIN SPHEROID BELONGING TO THE THIRD HARMONICS.
AD-614 155 DIV. 2
• • •
ON THE STABILITY OF THE JACOBI ELLIPSOIDS.
AD-614 156 DIV. 2
• • •
NON-RADIAL OSCILLATIONS OF GASEOUS MASSES.
AD-614 330 DIV. 2

•CHANG, Y. F.
• • •
POSSIBLE EXPERIMENTAL CONSEQUENCES OF TRIANGLE SINGULARITIES IN STRANGE-PARTICLE PRODUCTION PROCESSES.
AD-614 144 DIV. 20

•CHANOCK, R. M.
• • •
RELATIONSHIP OF RHINOVIRUS INFECTION TO MILD UPPER RESPIRATORY DISEASE. II. EPIDEMIOLOGIC OBSERVATIONS IN MALE MILITARY TRAINEES.
AD-614 305 DIV. 16

•CHAPPELL, GILFORD A.
• • •
REACTION KINETICS, THE THEORY OF LIQUIDS, AND OPTICAL ROTATION.
AD-614 083 DIV. 4

•CHARAP, J. M.
• • •
ASYMPTOTIC BEHAVIOR FOR LARGE IMAGINARY VALUES OF ANGULAR MOMENTUM OF THE AMPLITUDES FOR THE SCATTERING OF A DIRAC PARTICLE ON A CENTRAL SCALAR POTENTIAL,
AD-619 206 DIV. 25

•CHENEY, E. W.
• • •
GENERALIZED RATIONAL APPROXIMATION,
AD-619 528 DIV. 19

•CHERNIGOVSKII, A. A.
• • •
CALCULATION OF CHARGES DURING MASSIVE EXPLOSIONS FOR THROWING-OUT, 2 ED. REV
AD-619 987 DIV. 19

•CHINITZ, WALLACE
• • •
SHOCK-WAVE PROPAGATION IN LIQUID PROPELLANT ROCKET ENGINES.
AD-619 201 DIV. 27

•CHISTYAKOV, I. G.
• • •
GROWTH OF SINGLE-CRYSTALS NEMATIC FILMS,
AD-619 984 DIV. 25
• • •
VITRIFIED LIQUID-CRYSTAL FILMS,
AD-619 986 DIV. 25

•CHOW, K. K.
• • •
STUDY OF PLASMA AMPLIFIERS.
AD-619 253 DIV. 8

•CHRISTENSEN, C. A.
• • •
DEVELOPMENT OF AN ELECTRONIC DATA PROCESSING MODULE FOR MOBILE WING RECONNAISSANCE TECHNICAL SQUADRON.
AD-619 239 DIV. 18

•CHRISTIAN, GARY D.
• • •
COULOMETRIC DETERMINATION OF PROTEIN NITROGEN,
AD-619 341 DIV. 16
• • •
USE OF HIGHLY ACID SUPPORTING ELECTROLYTES IN POLAROGRAPHY. OBSERVED CHANGES IN POLAR OGRAPHIC WAVES OF SELENIUM (IV) UPON STANDING,
AD-619 382 DIV. 4

•CHUANG, K. C.
• • •
ELECTROCHEMICAL BEHAVIOR OF TIOX SOLID SOLUTIONS IN AQUEOUS HF AND HF-HCL MIXTURES.
AD-619 183 DIV. 4

•CHUBAKOV, A. E.
• • •
INVESTIGATIONS OF RADIATIONS ON MAN-MADE EARTH SATELLITE COSMOS-17,
AD-619 402 DIV. 12

•CIUCHTA, HENRY P.
• • •
USE OF ISOPROTERENOL AND PHENOXYBENZAMINE IN TREATMENT OF ENDOTOXIN SHOCK,
AD-619 266 DIV. 16

•COFFEEN, T.
• • •
WAVELENGTH DEPENDENCE OF POLARIZATION. III. THE LUNAR SURFACE,
AD-619 170 DIV. 2

•COHEN, MORRIS
• • •
THE ROLE OF CARBON AND FINE STRUCTURE IN THE HARDENING OF IRON-NICKEL-CARBON MARTENSITES
AD-619 447 DIV. 17

•COLE, G. S.
• • •
THERMAL CONVECTION DURING HORIZONTAL SOLIDIFICATION OF PURE METALS AND ALLOYS.
AD-619 182 DIV. 17

•COLEMAN, P. D.
• • •
STUDIES IN QUANTUM AND SOLID STATE ELECTRONICS.
AD-619 007 DIV. 25

•COLEMAN, PAUL D.
• • •
MILLIMETER WAVE GENERATION BY MULTIPLE QUANTUM CONVERSION.
AD-619 092 DIV. 8

•COLLIAS, EUGENE E.
• • •
PHYSICAL AND CHEMICAL DATA FOR PUGET SOUND AND APPRO ACHES, SEPTEMBER 1956DECEMBER 1957,
AD-619 455 DIV. 2

•COLLINS, E. W.
• • •
ELECTRONIC STRUCTURE OF DILUTE SOLID SOLUTION ALLOYS OF 3D-TRANSITION METALS IN A NON-MAGNETIC MATRIX.
AD-619 482 DIV. 25

•COLLINS, G. W.
• • •
STUDY OF SPECIAL BEAMSHAPING ANTENNAS.
AD-619 992 DIV. 8

•CONN, ARNOLD
• • •
PRODUCTION ENGINEERING MEASURE. HIGH VOLTAGE SILICON RECTIFIER STACKS.
AD-619 446 DIV. 8

•COOK, E. W.
• • •
QM ELASTOMER CONTRACT.
AD-619 945 DIV. 4

•COOMES, E. A.
• • •
THERMAL DESORPTION OF SR FROM W,
AD-619 142 DIV. 25

•COONEY, J. D.
• • •
THE EFFECT OF NONCELLULOSIC MATERIAL ON THE ACTINIC DEGRADATION OF COTTON FABRIC. PART II: COPPER OXINATE AND NICKEL OXINATE,
AD-619 499 DIV. 14

•COOPER, C. A.
• • •
A NEW LOOK AT CUSTOMS UNION THEORY,
AD-619 407 DIV. 92

•COOPMANS, PAUL
• • •
QUENCHING AND POST-IRRADIATION STUDIES ON CDS SINGLE CRYSTALS. TRANSPORT PROPERTIES OF BISMUTH ROLLED THIN FOILS.
AD-619 485 DIV. 25

•COPPENS, P.
• • •
DETERMINATION OF THE CRYSTAL STRUCTURE OF YTTRIUM ORTHOFERRITE AND REFINEMENT OF GADOLINIUM ORTHOFERRITE.
AD-619 495 DIV. 25

•CORNISH, JOSEPH J. , III.
• • •
A DEVICE FOR THE DIRECT MEASUREMENT OF UNSTEADY AIR FLOWS AND SOME CHARACTERISTICS OF BOUNDARY LAYER TRANSITION.
AD-619 008 DIV. 9

•COTTS, R. M.
• • •
ANOMALOUS NUCLEAR MAGNETIC RESONANCE LINEWIDTH IN LITHIUM
AD-619 365 DIV. 25
• • •
ESR MEASUREMENT OF SPIN SUSCEPTIBILITY OF GRAPHITE IN A LOW MAGNETIC FIELD,
AD-619 366 DIV. 20

•COX, A. LUCILE
• • •
PARTICLE GROWTH IN THE IONIC NUCLEATION CONDENSATION COLLOIDAL ION SOURCE,
AD-619 111 DIV. 27

•CREAGER, JOE S.
• • •
VARVED MARINE SEDIMENTS IN A STAGNANT FJORD,
AD-619 327 DIV. 2

•CRONIN, JANE
• • •
SOME PERIODIC SOLUTIONS OF A FOUR-BODY PROBLEM,
AD-619 295 DIV. 2

•CROSBY, WILLIAM H.
• • •
THE EFFECT OF DEXTRAN ON PLATELET FACTOR 3 ACTIVITY IN VITRO AND IN VIVO STUDIES
AD-619 342 DIV. 16

•CROUTZEILLES, M.
• • •
BERYLLIUM RESEARCH AND DEVELOPMENT PROGRAM. VOLUME VI. INFLUENCE OF THE DISTRIBUTION OF OXIDE AND THE TOTAL IMPURITY LEVEL ON RECRYSTALLIZATION AND GRAIN GROWTH OF BERYLLIUM.
AD-619 992 DIV. 17

•CROWLEY, DAVID E.
• • •
AUDITORY RESPONSES IN THE ALLIGATOR LIZARD,
AD-619 339 DIV. 16
• • •
FURTHER STUDIES OF HEARING IN THE GEKKONID LIZARDS,
AD-619 340 DIV. 16

•CSANYI, ATTILA P.
• • •
PROGRAMMING METHOD AND RESPONSE MODE IN A VISUAL ORAL TASK.
AD-619 014 DIV. 28

•CULSHAW, W.
• • •
HANLE EFFECT IN THE HE-NE LASER,
AD-619 360 DIV. 25

•CUMMINGS, R. D.
• • •
THE PRODUCTION OF INTENSE MAGNETIC FIELDS BY MEANS OF LIQUID NITROGEN COOLED COPPER

COILS.
AD-613 967 DIV. 25

•CURRY, E. E.
• • •
THE ANALYSIS OF ROUND-OFF AND TRUNCATION ERRORS OF THE CONTROLLER IN A HYBRID (DIGITAL-ANALOG) CONTROL SYSTEM
AD-614 281 DIV. 20

•CURTIS, E. C.
• • •
THE ANHARMONICITY CORRECTION FOR POLYATOMIC MOLECULES. PART II. METHANE,
AD-614 088 DIV. 25
• • •
THE ANHARMONICITY CORRECTION FOR POLYATOMIC MOLECULES. PART I. METHODS AND APPLICATION TO CH2O,
AD-614 177 DIV. 25

•CURTSINGER, B. E.
• • •
FIRST TEST ON RADIATION EXPERIMENTATION FOR THE Q-FACTOR TECHNIQUE.
AD-614 112 DIV. 8

•CUTLER, A. J. B.
• • •
EXCESS THERMODYNAMIC FUNCTIONS FOR LIQUID MIXTURES OF METHANE+PROPANE,
AD-614 517 DIV. 4

•CVETANOVIC, R. J.
• • •
PHOTOCHEMICAL ADDITION OF HYDROGEN BROMIDE TO 2-BUTENE IN THE GAS PHASE,
AD-614 500 DIV. 4
• • •
COLLISIONAL DEACTIVATION OF THE EXCITED SINGLET OXYGEN ATOMS AND THEIR INSERTION INTO THE CH BONDS OF PROPANE
AD-614 502 DIV. 4

•CZYZAK, S. J.
• • •
TABLE OF HARTREE-FOCK SELF CONSISTENT FIELD WAVE FUNCTIONS WITH EXCHANGE.
AD-614 428 DIV. 2

•DAHLE, E.
• • •
STUDIES ON THE ROLE OF POTASSIUM IONS IN THE LETHAL TOXICITY OF STREPTOLYSIN O
AD-614 198 DIV. 16

•DALITZ, R. H.
• • •
SOME POSSIBILITIES FOR UNUSUAL LIGHT HYPERNUCLEI
AD-614 539 DIV. 20

•DALKEY, NORMAN C.
• • •
FOUR-COLOR REDUCIBILITY OF PLANAR GRAPHS CONTAINING SUBGRAPHS WITH FOUR-POINT BOUNDARIES,
AD-614 412 DIV. 15

•DANNBERG, WOLF
• • •
COMMENTS ON THE EFFECT OF A DEFORMED, PLANE PARALLEL GLASS PLATE IN THE IMAGE PLANE OF AN OBJECTIVE ON ITS DISTORTION
AD-614 401 DIV. 2

•DAVIDSON, THOMAS E.
• • •
THE BAUSCHINGER EFFECT IN A HIGH STRENGTH STEEL.
AD-614 115 DIV. 17

•DAVIS, D. H.
• • •
A DETERMINATION OF THE SPIN OF LITHIUM 8 HYPERNUCLEUS
AD-614 187 DIV. 20
• • •
ABSORPTION OF SIGMA(-) HYPERONS IN PHOTOGRAPHIC EMULSION NUCLEI,
AD-614 213 DIV. 20

•DAVIS, RICHARD L.
• • •
SPONGY DEGENERATION OF THE NERVOUS SYSTEM: A REPORT OF FOUR CASES WITH A REVIEW OF THE LITERATURE,
AD-614 337 DIV. 16

•DAVISON, CLAIRE L.
• • •
ELIMINATION OF SULFUR MUSTARD-INDUCED ALKYLATION PRODUCTS FROM DNA OF ESCHERICHIA COLI,
AD-614 267 DIV. 16
• • •
UNBALANCED GROWTH AND LATENT KILLING OF ESCHERICHIA COLI FOLLOWING EXPOSURE TO SULFUR MUSTARD.
AD-614 284 DIV. 16

•DAWSON, WILLIAM A.
• • •
VARVED MARINE SEDIMENTS IN A STAGNANT FJORD,
AD-614 327 DIV. 2

•DE BOER, J.
• • •
COULOMB EXCITATION OF TM169,
AD-614 209 DIV. 20

•DE VORE, CHARLES
• • •
GOVERNMENT SOURCES OF R AND D INFORMATION,
AD-614 356 DIV. 32

•DEATON, B. C.
• • •
RESONANT ABSORPTION OF ULTRASOUND BY OPEN-ORBIT ELECTRONS IN CADMIUM,
AD-614 372 DIV. 25

•DEBRUNNER, P.
• • •
DETERMINATION OF RECOILLESS FRACTIONS FROM MOSSBAUER SCATTERING,
AD-614 368 DIV. 20

•DECKER, B. LOUIS
• • •
GRAVITY DISTURBANCE COMPONENTS FROM A SPHERICAL HARMONIC EXPANSION OF THE DISTURBING POTENTIAL,
AD-613 956 DIV. 2

•DEFALCO, ALFRED J.
• • •
IMPORTANCE OF PREVENTING RENAL VASCULAR COLLAPSE DURING PERIOD OF RENAL ISCHEMIA IN KIDNEY TRANSPLATATION,
AD-614 298 DIV. 16

•DEGOWIN, RICHARD L.
• • •
RELATIONSHIP BETWEEN ACTIVITY OF PYRUVATE KINASE AND AGE OF THE NORMAL HUMAN ERYTHROCYTE,
AD-614 522 DIV. 16

•DEICH, M. E.
• • •
SPEED OF SOUND IN TWO-PHASE MEDIA,
AD-614 015 DIV. 25

•DENISOVA, A. M.
• • •
THE INFLUENCE OF CERTAIN PHARMACOLOGICAL PREPARATIONS ON THE BIOELECTRIC ACTIVITY OF THE BRAIN IN SCHIZOPHRENIA
AD-614 403 DIV. 16

•DESSLER, A. J.
• • •
DISCUSSION OF PAPER BY E. J. STEGELMANN AND C. H. VON KENSCHITZKI, 'ON THE INTERPRETATION OF THE SUDDEN COMMENCEMENT OF GEOMAGNETIC STORMS'
AD-614 168 DIV. 2

•DEWITT, BRYCE S.
• • •
FALLING CHARGES,
AD-614 166 DIV. 25

•DEWITT, CECILE MORETTE
• • •
FALLING CHARGES,
AD-614 166 DIV. 25

•DIAZ, J. B.
• • •
EQUIVALENCE OF CERTAIN INEQUALITIES COMPLEMENTING THOSE OF CAUCHY-SCHWARZ AND HOLDER,
AD-614 158 DIV. 15

•DIEBOLD, E. J.
• • •
PRODUCTION ENGINEERING MEASURE. HIGH VOLTAGE SILICON RECTIFIER STACKS.
AD-614 446 DIV. 8

•DIETZ, FRANK T.
• • •
SOME CHARACTERISTICS OF 25-CPS SHALLOW-WATER AMBIENT NOISE.
AD-614 546 DIV. 2

•DIMMOCK, J. O.
• • •
BAND STRUCTURE AND MAGNETISM OF GADOLINIUM METAL,
AD-614 557 DIV. 25

•DIONNE, GERALD F.
• • •
CALCULATION OF CRYSTAL-FIELD ENERGY-LEVEL SPLITTINGS OF THE TI(3+) ION IN RBAL(SO4) 2.12H2O,
AD-614 357 DIV. 25

•DISHONG, PAUL H.
• • •
PROJECT ANNA OPTICAL OBSERVATIONS.
AD-613 938 DIV. 2

•DOBSON, JOHN
• • •
SEMANTIC BASIS OF COMMUNICATION.
AD-614 093 DIV. 32

•DOLAN, E.
• • •
ARYL BORON FREE RADICALS
AD-614 547 DIV. 4

•DOMBEY, N.
• • •
ON MASSIVE AND MASSLESS PHOTONS,
AD-614 184 DIV. 25

•DOMINGO, JOHN J.
• • •

THE EFFECT OF THE 3.10 MEV STATE OF F17 ON THE O16(P, GAMMA) REACTION,
AD-614 204 DIV. 20

•DORDICK, H. S.
• • •
THE DESIGNER'S IMPACT ON LOGISTICS,
AD-614 057 DIV. 18

•DOSANJH, DARSHAN S.
• • •
INTERACTION OF A STARTING VORTEX AS WELL AS A VORTEX STREET WITH A TRAVELING SHOCK WAVE.
AD-614 311 DIV. 9

•DOUGLAS, A. E.
• • •
LABORATORY INVESTIGATIONS OF THE INTERSTELLAR RADIO-FREQUENCY LINES OF CH AND OTHER MOLECULES,
AD-614 518 DIV. 4

•DRESSELHAUS, MILDRED S.
• • •
OBSERVATION OF INTERBAND TRANSITIONS IN ANTIMONY,
AD-614 312 DIV. 25

•DUANGHANI, CHIRAPHUN
• • •
A FIELD TRIAL OF A NEW TRANSPORT MEDIUM FOR COLLECTION OF FECES FOR BACTERIOLOGIC EXAMINATION,
AD-614 191 DIV. 16

•DURE, A.
• • •
RECRYSTALLIZATION KINETICS OF MARTENSITIC EXTRA-LOW CARBON STEELS,
AD-614 501 DIV. 17

•DUFKER, JAMES E.
• • •
PHOTOELECTRIC EMISSION FROM BARIUM OXIDE,
AD-614 326 DIV. 25

•DUFFY, JAMES V.
• • •
NEW ARYLOXY ALKOXYSILANES (I),
AD-613 936 DIV. 14

•DUFFY, JOHN C.
• • •
FLYING STRESS IN RELATION TO FLYING PROFICIENCY,
AD-614 332 DIV. 16

•DUNGAN, W. E.
• • •
DEVELOPMENT AND APPLICATION OF NUCLEAR MEASUREMENT TECHNIQUES,
AD-614 109 DIV. 16

•DUNN, J. L.
• • •
OPTICAL DETECTION OF MICROWAVE TRANSITIONS BETWEEN EXCITED ELECTRONIC STATES OF CN AND THE IDENTIFICATION OF THE TRANSITIONS INVOLVED
AD-614 553 DIV. 25

•DUNNING, CLEVELAND L.
• • •
SKIN FRICTION DRAG AND SHEAR STRESS DISTRIBUTION ON SEVERAL STREAMLINED BODIES OF REVOLUTION WITH VARIED FINENESS RATIO.
AD-614 237 DIV. 9

•DWIGHT, K.
• • •
MAGNETIC PROPERTIES OF V(3+) IONS IN CUBIC SPINELS
AD-614 319 DIV. 25

•EASTERDAY, J. L.
• • •
RELIABILITY OF INTEGRATED CIRCUITS USED IN MISSILE SYSTEMS
AD-614 103 DIV. 8

•ECCLES, P. J.
• • •
ISOTROPY OF COSMIC RADIATION
AD-614 381 DIV. 2

•EDELMAN, RALPH E.
• • •
SILICON AND ZINC EFFECT ON MAGNESIUM-LITHIUM AND MAGNESIUM-LITHIUM-SILVER ALLOYS.
AD-614 422 DIV. 17

•EDERER, D. L.
• • •
PHOTOIONIZATION CROSS SECTION OF HELIUM IN THE 100- TO 250-A REGION,
AD-614 539 DIV. 25

•EDWARDS, V. H.
• • •
EXTENT OF ANTIGENIC VARIATION OF A2 INFLUENZA VIRUSES FROM PROTOTYPE STRAINS,
AD-614 348 DIV. 16

•EDWARDS, WARD
• • •
HUMAN PROCESSING OF EQUIVOCAL INFORMATION.
AD-613 949 DIV. 28

•EIBSCHUTZ, M.
• • •
DETERMINATION OF THE CRYSTAL STRUCTURE OF YTTRIUM ORTHOFERRITE AND REFINEMENT OF GADOLINIUM ORTHOFERRITE.
AD-614 498 DIV. 25

•EICHELBERGER, JAMES W. , JR.
• • •
THE EFFECT OF DEXTRAN ON PLATELET FACTOR 3 ACTIVITY IN VITRO AND IN VIVO STUDIES
AD-614 342 DIV. 16

•ELIASON, D. W.
• • •
A PILOT DISPLAY CONCEPT FOR NEAR-TARGET MANEUVERS DURING RENDEZVOUS,
AD-613 958 DIV. 12

•ELLIOTT, G. A.
• • •
LABORATORY INVESTIGATIONS OF THE INTERSTELLAR RADIO-FREQUENCY LINES OF CH AND OTHER MOLECULES,
AD-614 518 DIV. 4

•ELLIOTT, R. L.
• • •
SYNTHESIS OF ELASTOMERS CONTAINING SI-N BONDS IN THE MAIN CHAIN.
AD-614 473 DIV. 4

•ELLIS, JAMES P. , JR.
• • •
FLYING STRESS IN RELATION TO FLYING PROFICIENCY,
AD-614 332 DIV. 16

•EMEL'YANOVA, M. Z.
• • •
EXPERIMENTAL PROGNOSES OF AIRCRAFT BUMPINESS BY A DEFINED RICHARDSON CRITERION
AD-614 016 DIV. 1

•EMMANUEL, CONSTANTINOS B.
• • •
OPTICAL SCINTILLATION; A SURVEY OF THE LITERATURE
AD-614 056 DIV. 2

•ENIG, JULIUS W.
• • •
ON EQUATIONS OF STATE IN SHOCK INITIATION PROBLEMS.
AD-613 989 DIV. 4

•EPSTEIN, JOSEPH
• • •
REACTIONS OF ISOPROPYL METHYLPHOSPHONOFLUORIDATE WITH SUBSTITUTED PHENOLS. II,
AD-614 304 DIV. 4

•ERICKSON, C. A.
• • •
QM ELASTOMER CONTRACT.
AD-613 945 DIV. 4

•ERICKSON, PORTER W.
• • •
NEW ARYLOXY ALKOXYSILANES (I),
AD-613 936 DIV. 14

•EVANS, J. V.
• • •
CAUSE OF THE MID-LATITUDE EVENING INCREASE IN FOF2.
AD-614 310 DIV. 2

•EVERHART, EDGAR
• • •
CHARGE-STATE CORRELATIONS IN AR(+) -AR COLLISIONS,
AD-614 545 DIV. 25

•EVERSON, K. M.
• • •
OPTICAL DETECTION OF MICROWAVE TRANSITIONS BETWEEN EXCITED ELECTRONIC STATES OF CN AND THE IDENTIFICATION OF THE TRANSITIONS INVOLVED
AD-614 553 DIV. 25

•EWALD, ROGER A.
• • •
THE EFFECT OF DEXTRAN ON PLATELET FACTOR 3 ACTIVITY IN VITRO AND IN VIVO STUDIES
AD-614 342 DIV. 16

•FASSELL, W. M. , JR.
• • •
ESTIMATING METAL PARTICLE COMBUSTION KINETICS,
AD-614 563 DIV. 10

•FAY, W. J.
• • •
TRADEWIND DUCTING.
AD-614 240 DIV. 8

•FEDOROV, V.
• • •
SUBTERRANEAN LIGHT,
AD-614 024 DIV. 16

•FEIGL, ERIC O.
• • •
WATER AND ELECTROLYTE CONTENT OF NORMAL AND HYPERTENSIVE ARTERIES IN DOGS,
AD-614 561 DIV. 16

•FEIT, JAMES
• • •
SMALL SIGNAL SEMICONDUCTOR COMPOSITES.
AD-614 090 DIV. 8

•FELDMAN, G.
• • •
SCATTERING MATRIX APPROACH TO THE LAMBDA HYPERON-PION

RESONANCE,
AD-619 374 DIV. 20

•FELSHER, MURRAY
• • •
A CORE ALIGNER DESIGNED TO RECOVER ORIENTED RECENT MARINE CORES,
AD-619 331 DIV. 2

•FENN, ROBERT M.
• • •
SOURCES OF METEOROLOGICAL DATA FOR WEAPONS SYSTEMS STUDIES.
AD-619 262 DIV. 22

•FERGUSON, ELDON E.
• • •
CHARGE-TRANSFER ABSORPTION SPECTRA OF NO IN KR AND CH3OH SOLUTIONS.
AD-619 552 DIV. 25

•FERRELL, RICHARD A.
• • •
FUNDAMENTAL PROBLEMS OF SOLIDS.
AD-619 136 DIV. 25

•FEY, M. G.
• • •
LONG LIFE CLOSED LOOP MHD RESEARCH AND DEVELOPMENT UNIT.
AD-619 458 DIV. 25

•FIEL, LARRY D.
• • •
ELECTROCHEMICAL STUDIES IN THE SYNTHESIS OF N-F COMPOUNDS.
AD-619 098 DIV. 4

•FILBY, J. D.
• • •
THE SPECIFIC HEATS BELOW 320K OF POTASSIUM, RUBIDIUM AND CAESIUM,
AD-619 520 DIV. 25

•FILIPPOV, G. A.
• • •
SPEED OF SOUND IN TWO-PHASE MEDIA,
AD-619 015 DIV. 25

•FINE, BEN S.
• • •
OCULAR COMPLICATIONS OF STEROID THERAPY,
AD-619 186 DIV. 16

•FINLEY, F. RAY
• • •
A CORRELATIONAL STUDY OF MYOPOTENTIAL RESPONSE AND FORCE OF MUSCLE CONTRACTION DURING VARYING ACTIVITY DEMANDS.
AD-613 930 DIV. 30

•FINN, MARY C.
• • •
ELECTROCHEMICAL DEMBER EFFECT IN SEMICONDUCTORS,
AD-619 180 DIV. 25

•FISCH, S. M.
• • •
COMPUTER ALGORITHM FOR FAULT ISOLATION AND TEST POINT SELECTION.
AD-613 960 DIV. 8

•FISCHLER, SIDNEY
• • •
RAPID-FREEZE METHOD FOR GROWTH OF BISMUTH SINGLE CRYSTALS
AD-619 318 DIV. 17

•FISCHTHAL, JACOB H.
• • •
A MONOGENETIC AND SEVEN DIGENETIC TREMATODES OF AMPHIBIANS AND REPTILES FROM PALAWAN ISLAND, PHILIPPINES,
AD-619 302 DIV. 16

•FOLEY, JOHN M.
• • •
VISUAL SPACE: A TEST OF THE CONSTANT CURVATURE HYPOTHESIS,
AD-619 263 DIV. 28
• • •
DESARGUESIAN PROPERTY IN VISUAL SPACE,
AD-619 264 DIV. 28

•FORSBERG, KEVIN
• • •
INFLUENCE OF BOUNDARY CONDITIONS ON THE MODAL CHARACTERISTICS OF THIN CYLINDRICAL SHELLS.
AD-619 271 DIV. 25

•FORSYTH, B. R.
• • •
RELATIONSHIP OF RHINOVIRUS INFECTION TO MILD UPPER RESPIRATORY DISEASE. II. EPIDEMIOLOGIC OBSERVATIONS IN MALE MILITARY TRAINEES.
AD-619 309 DIV. 16
• • •
PATTERNS OF ADENOVIRUS INFECTIONS IN MARINE CORPS PERSONNEL. I. A 42-MONTH SURVEY IN RECRUIT AND NON-RECRUIT POPULATIONS. II. LONGITUDINAL STUDY OF SUCCESSIVE ADVANCED RECRUIT TRAINING COMPANIES.
AD-619 306 DIV. 16

•FREED, N.
• • •
MAGNETIC DIPOLE MOMENTS OF ODD-MASS NUCLEI IN THE SPHERICAL REGION,
AD-619 496 DIV. 20

•FREEMAN, A. J.
• • •
BAND STRUCTURE AND MAGNETISM OF GADOLINIUM METAL,
AD-619 557 DIV. 25

•FRENI, MARIA
• • •
NEW TRIPHENYLPHOSPHINE HYDRIDES OF RHENIUM (NUOVI IDRURI TRIFENILFOSFINICI DI RENIO),
AD-619 207 DIV. 4

•FRIDMAN, J. D.
• • •
CALIBRATION OF A PRESSURE SENSOR FOR MEASUREMENTS IN CONTINUUM AND RAREFIED GAS FLOWS,
AD-619 424 DIV. 30

•FRIEDEL, HELMUT
• • •
INTERPRETATION OF MAGNETO GASDYNAMIC FLOW PATTERNS,
AD-619 050 DIV. 25

•FRILLMAN, F. E.
• • •
THE DTMB TYPE 337-1A ELECTRONIC LOW-PASS FILTER INSTRUCTION MANUAL,
AD-613 948 DIV. 8

•FRISCH, H. L.
• • •
HIGH-FIELD MAGNETORESISTANCE OF INHOMOGENEOUS SEMICONDUCTORS AND PLASMAS. III. TWO-DIMENSIONAL INHOMOGENEITY DISTRIBUTIONS
AD-619 163 DIV. 25

•FROHLICH, DIETMAR
• • •
EXCITON ABSORPTION IN THE PRESENCE OF EXCITED F-CENTERS,
AD-619 487 DIV. 25

•FRY, FRANCIS J.
• • •
THE EFFECT OF ULTRASOUND ON BIOLOGICAL TISSUE.
AD-619 370 DIV. 16

•FRY, WILLIAM J.
• • •
THE EFFECT OF ULTRASOUND ON BIOLOGICAL TISSUE.
AD-619 370 DIV. 16

•FUKUDA, NORIKO
• • •
HARMONIC FUNCTIONS WITH GIVEN VALUES AND MINIMUM NORMS IN RIEMANNIAN SPACES,
AD-619 543 DIV. 19

•FULTON, T.
• • •
SCATTERING MATRIX APPROACH TO THE LAMBDA HYPERON-PION RESONANCE,
AD-619 374 DIV. 20

•GAHM, W. L.
• • •
RELIABILITY OF INTEGRATED CIRCUITS USED IN MISSILE SYSTEMS
AD-619 103 DIV. 8

•GAIDIS, JAMES M.
• • •
SYNTHESIS OF A SILAZAROPH ENANTHRENE,
AD-613 923 DIV. 4

•GAINES, SIDNEY
• • •
A FIELD TRIAL OF A NEW TRANSPORT MEDIUM FOR COLLECTION OF FECES FOR BACTERIOLOGIC EXAMINATION,
AD-619 191 DIV. 16

•GALIBOIS, A.
• • •
RECRYSTALLIZATION KINETICS OF MARTENSITIC EXTRA-LOW CARBON STEELS,
AD-619 501 DIV. 17

•GAMBURG, A. L.
• • •
THE INFLUENCE OF CERTAIN PHARMACOLOGICAL PREPARATIONS ON THE BIOELECTRIC ACTIVITY OF THE BRAIN IN SCHIZOPHRENIA
AD-619 403 DIV. 16

•GANNON, J. A.
• • •
QM ELASTOMER CONTRACT.
AD-613 949 DIV. 4

•GARCIA, T. J.
• • •
LATERAL-PLATE TESTS WITH PLATE DIAMETER VARIED.
AD-613 991 DIV. 2

•GARNOV, V. V.
• • •
HIGH-SPEED COLOR PHOTOGRAPHY OF SELFLUMINOUS PROCESSES
AD-619 398 DIV. 24

•GARRISON, M. V.
• • •
SYNTHESIS OF ETHYL P-NITROPHENYL ALPHAMETHOXYALKYL-PHOSPHONATES,
AD-619 350 DIV. 4

•GATOS, H. C.
• • •
SOLID STATE RESEARCH.
AD-613 961 DIV. 25

•GAVENDA, J. D.
• • •
RESONANT ABSORPTION OF ULTRASOUND BY OPEN-ORBIT ELECTRONS IN CADMIUM,
AD-614 372 DIV. 25

•GEHATIA, MATATIAHU
• • •
STATIONARY STATE CRITERION FOR FREE RADICAL POLYMERIZATION FOR LINEARLY INCREASING REAC TION TEMPERATURE.
AD-614 077 DIV. 4

•GEHRELS, T.
• • •
WAVELENGTH DEPENDENCE OF POLARIZATION. III. THE LUNAR SURFACE,
AD-614 170 DIV. 2

•GEHRELS, THOMAS
• • •
A MODEL OF THE LUNAR SURFACE,
AD-614 169 DIV. 2

•GEORGE, CLAY E.
• • •
SOME DETERMINANTS OF SMALL-GROUP EFFECTIVENESS.
AD-613 954 DIV. 28

•GEORGE, JAMES
• • •
PRODUCTION ENGINEERING MEASURE FOR CESIUM BEAM TUBES.
AD-614 118 DIV. 8

•GERICKE, OTTO R.
• • •
ULTRASONIC SPECTROSCOPY OF STEEL,
AD-614 113 DIV. 26

•GETTY, W. D.
• • •
GENERATION OF A HOT, DENSE PLASMA BY A COLLECTIVE BEAM-PLASMA INTERACTION,
AD-614 384 DIV. 25

•GHOSH, S. P.
• • •
OPTIMUM STRATIFICATION WITH TWO CHARACTERS.
AD-614 526 DIV. 15

•GIANNOTTO, JOSEPH M.
• • •
TUNABLE PRESELECTION THROUGH PARAMETRIC CONVERSION
AD-614 027 DIV. 8

•GIARDINI, A. A.
• • •
CURIE POINT MEASUREMENT AT HIGH PRESSURE BY A SINGLE COIL TECHNIQUE,
AD-614 322 DIV. 30

•GIBBONS, F. L.
• • •
THE INTERACTIONS OF 14.6-MEV NEUTRONS IN IRON, LITHIUM-7, AND CARBON.
AD-614 491 DIV. 20

•GIBBS, B. W.
• • •
ELECTROMAGNETIC WAVE PROPAGATION IN ANISOTROPIC PLASMAS ALONG THE DIRECTION OF A STATIC MAGNETIC FIELD
AD-614 442 DIV. 25

•GIBBS, MARY B.
• • •
EVALUATION OF ELECTRONIC MEASUREMENTS OF HEMAGGLUTINATION FOR QUANTITATIVE STUDIES. I. LIMITATIONS IN THE APPLICATION OF INSTRUMENT MEASUREMENTS
AD-614 344 DIV. 16

•GIBSON, FRANK C.
• • •
STRESS WAVES IN BOUNDED MEDIA.
AD-613 939 DIV. 22

•GILL, ARTHUR
• • •
ANALYSIS AND SYNTHESIS OF STABLE LINEAR SEQUENTIAL CIRCUITS,
AD-614 164 DIV. 30

•GILL, H. L.
• • •
LATERAL-PLATE TESTS WITH PLATE DIAMETER VARIED.
AD-613 991 DIV. 2

•GINGRAS, B. A.
• • •
THE EFFECT OF NONCELLULOSIC MATERIAL ON THE ACTINIC DEGRADATION OF COTTON FABRIC. PART II: COPPER OXINATE AND NICKEL OXINATE,
AD-614 499 DIV. 14

•GINSBERG, ALLEN S.
• • •
PROGRAMMING BY QUESTIONNAIRE
AD-613 976 DIV. 30

•GINSBERG, D. M.
• • •
CALCULATION OF THE QUASIP ARTICLE RECOMBINATION TIME IN A SUPERCONDUCTOR,
AD-614 367 DIV. 25

•GINSBURG, SEYMOUR
• • •
PRESERVATION OF UNAMBIGUITY AND INHERENT AMBIGUITY IN CONTEXT FREE LANGUAGES.
AD-614 073 DIV. 30

•GLASER, P. E.
• • •
STUDIES OF THE PHYSICAL CHARACTERISTICS OF PROBABLE LUNAR SURFACE MATERIALS: PART II.
AD-613 969 DIV. 2

•GLASER, ROBERT
• • •
PROGRAMMING METHOD AND RESPONSE MODE IN A VISUAL ORAL TASK.
AD-614 014 DIV. 28

•GLASS, A. M.
• • •
THE EFFECT OF STRAIN ON THE EXCITON SPECTRUM OF GERMANIUM,
AD-614 200 DIV. 25

•GLASS, JOHN C.
• • •
INVESTIGATION OF A MULTIPLE BEAM SCANNING CIRCULAR ARRAY.
AD-614 288 DIV. 8

•GLONTI, G. A.
• • •
STABILITY OF A FLAT LAYER OF IDEALLYCONDUCTING VISCOUS FLUID IN A LONGITUDINAL MAGNETIC FIELD,
AD-614 026 DIV. 25

•GLOVER, FRED
• • •
A MULTIPHASE-DUAL ALGORITHM FOR THE ZEROONE INTEGER PROGRAMMING PROBLEM.
AD-614 121 DIV. 15

•GOFFMAN, WILLIAM
• • •
METHODOLOGY FOR TEST AND EVALUATION OF INFORMATION RETRIEVAL SYSTEMS,
AD-614 005 DIV. 32

•GOINS, A. E.
• • •
TARGET CAPABILITY VERSUS PRESUMED INTENTION AS A BASIS FOR DECISION IN COMBAT INFORMATION CENTERS.
AD-613 944 DIV. 5

•GOLD, EUGENE F.
• • •
PEPTIDE MAPS OF ANTIBODIES AGAINST AN ANTIGEN CONTAINING TWO DIFFERENT DETERMINANT GROUPS,
AD-614 313 DIV. 16

•GOLDMAN, A. J.
• • •
EQUIVALENCE OF CERTAIN INEQUALITIES COMPLEMENTING THOSE OF CAUCHY-SCHWARZ AND HOLDER,
AD-614 158 DIV. 15

•GONZALEZ, MANUEL A.
• • •
DIPOLE EXCITED UNIDIRECTI ONALLY CONDUCTING SPHERE.
AD-614 078 DIV. 8

•GOODSON, J. E.
• • •
OPHTHALMOSCOPY OF PIGEONS USING TRANSILLUMINATION,
AD-614 194 DIV. 16

•GORSHKOV, G. A.
• • •
STUDYING MECHANICAL AND THERMAL FATIGUE OF METALS BY THE INTERNAL FRICTION METHOD
AD-614 019 DIV. 17

•GORSLINE, DONN S.
• • •
MARINE GEOLOGY AND OCEANO GRAPHY OF FLORIDA BAY, APALACHICOLA BAY AND VICINITY, FLORIDA.
AD-614 437 DIV. 2

•GOVER, S. C.
• • •
FREE-RUNNING MODEL TECHNIQUES FOR THE EVALUATION OF SHIP-HANDLING QUALITIES,
AD-614 114 DIV. 31

•GOW, ANTHONY J.
• • •
AGE HARDENING OF SNOW AT THE SOUTH POLE,
AD-614 430 DIV. 13

•GRAHAM, C. H.
• • •
MAINTAINING AN ABSOLUTE HUE IN THE PRESENCE OF DIFFERENT BACKGROUND COLORS,
AD-614 199 DIV. 16

•GRAHAM, JAMES H.
• • •
DIFFERENTIATION OF NEVOID BASAL CELL CARCINOMA FROM EPITHELIOMA ADENOIDES SYSTICUM: A CLINICOPATHOLOGIC AND HISTO CHEMICAL STUDY,
AD-614 353 DIV. 16

•GRAY, HOWARD R.
• • •
DIFFERENTIATION OF NEVOID BASAL CELL CARCINOMA FROM EPITHELIOMA ADENOIDES SYSTICUM; A CLINICOPATHOLOGIC AND HISTOCHEMICAL STUDY,
AD-614 393 DIV. 16

•GRAZIANO, EUGENE E.
• • •
WRITING AND SUBMITTING THE SUCCESSFUL PROPOSAL. A SELECTIVE ANNOTATED BIBLIOGRAPHY
AD-614 269 DIV. 26

•GREENBERG, O. W.
• • •
COUPLING OF INTERNAL AND SPACE-TIME SYMMETRIES
AD-614 181 DIV. 20

•GREGG, DONALD E.
• • •
METABOLIC RESPONSES DURING MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG
AD-614 346 DIV. 16
• • •
MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG
AD-614 347 DIV. 16

•GROFF, JAMES L.
• • •
COMPARISON OF THE PEPTIDE MAPS OF ANTI= BODIES AGAINST AN ACIDIC AND A BASIC DETERMINANT GROUP,
AD-614 218 DIV. 16

•GROSS, H. GRANT
• • •
VARVED MARINE SEDIMENTS IN A STAGNANT FJORD,
AD-614 327 DIV. 2

•GUCLUER, SEVKET M.
• • •
VARVED MARINE SEDIMENTS IN A STAGNANT FJORD,
AD-614 327 DIV. 2

•GUILE, DONALD L.
• • •
SEMICONDUCTING MATERIALS. PART III. AN INVESTIGATION OF THE DIELECTRIC PROPERTIES OF SINGLE-CRYSTAL VERSUS POLYCRYSTALLINE MATERIALS.
AD-614 472 DIV. 14

•GUPTA, SHANTI S.
• • •
SELECTION AND RANKING PROCEDURES AND ORDER STATISTICS FOR THE BINOMIAL DISTRIBUTION
AD-614 070 DIV. 15
• • •
NONPARAMETRIC LIFE TEST SAMPLING PLANS,
AD-614 490 DIV. 15

•GYUK, I. P.
• • •
CONSIDERATIONS ON THE ISOBAR MECHANISM AND RESONANCE POLES FOR PION-BARYON SYSTEMS
AD-614 143 DIV. 20
• • •
MESON-BARYON SYSTEMS AND THEIR RESONANCES,
AD-614 152 DIV. 20

•HAASE, KURT H.
• • •
A SYMBOLIC NOTATION APPLIED TO UNBALANCED LADDER NETWORKS.
AD-614 141 DIV. 8

•HACKENBERGER, GEORGE I.
• • •
DEVELOPMENT OF A CRASHWORTHY, ARMORED, UNIVERSAL CREW SEAT FOR U. S. ARMY AIRCRAFT.
AD-614 231 DIV. 1

•HADGIGEORGE, GEORGE
• • •
PROJECT ANNA OPTICAL OBSERVATIONS.
AD-613 938 DIV. 2

•HADNI, A.
• • •
RESEARCH ON BASIC FAR-INFRARED TECHNIQUES.
AD-613 966 DIV. 20

•HAFNER, L. S.
• • •
SYNTHESIS OF ETHYL P-NITROPHENYL ALPHAMETHOXYALKYL-PHOSPHONATES,
AD-614 350 DIV. 4

•HAGFORS, T.
• • •
MEASUREMENT OF PROPERTIES OF SPREAD CHANNELS BY THE TWO-FREQUENCY METHOD WITH APPLICATION TO RADAR ASTRONOMY
AD-614 233 DIV. 2

•HAIR, HUGH A.
• • •
DEVELOPMENT OF HELICAL PHASE-SHIFTERS.
AD-614 069 DIV. 8

•HAKIMI, S. L.
• • •
A NOTE ON ACTIVE RC REALIZATION OF VOLTAGE TRANSFER FUNCTIONS.
AD-614 554 DIV. 8
• • •
DISTANCE MATRIX OF A GRAPH AND ITS REALIZABILITY
AD-614 559 DIV. 15

•HALBERT, S. P.
• • •
STUDIES ON THE ROLE OF POTASSIUM IONS IN THE LETHAL TOXICITY OF STREPTOLYSIN O
AD-614 198 DIV. 16

•HALE, HENRY B.
• • •
FLYING STRESS IN RELATION TO FLYING PROFICIENCY,
AD-614 332 DIV. 16

•HALLER, KURT
• • •
SCATTERING, WEAK DECAYS, AND FINAL-STATE INTERACTIONS IN MODEL THEORIES IN A DRESSED PARTICLE PICTURE,
AD-614 375 DIV. 20

•HALLIDY, W.
• • •
BEAMS OF HELIUM ATOMS AT TEMPERATURES BELOW 0.5 K,
AD-614 373 DIV. 25

•HARDAWAY, ROBERT M.
• • •
PULMONARY MICROTHROMBI
AD-614 349 DIV. 16

•HARRELL, WALLACE E., JR.
• • •
ELECTROCHEMICAL STUDIES IN THE SYNTHESIS OF N-F COMPOUNDS.
AD-614 098 DIV. 4

•HARRIS, M.
• • •
MICROWAVE NONLINEAR DIELECTRIC MATERIALS.
AD-614 274 DIV. 14

•HARRISON, W. B.
• • •
FABRICATION AND FRACTURE OF POLYCRYSTALLINE NIO,
AD-614 263 DIV. 14
• • •
MECHANICAL BEHAVIOR OF POLYCRYSTALLINE CERAMICS.
AD-614 265 DIV. 14

•HARVEY, A. L.
• • •
DISCUSSION OF THE WEAK AND STRONG PRINCIPLES OF EQUIVALENCE,
AD-614 165 DIV. 25
• • •
ON THE SCALAR THEORY OF GRAVITATION,
AD-614 351 DIV. 25

•HARVEY, W. W.
• • •
ELECTROCHEMICAL DEMBER EFFECT IN SEMICONDUCTORS,
AD-614 180 DIV. 25

•HATKIN, L.
• • •
CRITERIA FOR OPTICAL MASER AMPLIFIERS AND OSCILLATORS.
AD-614 209 DIV. 25

•HAUROWITZ, F.
• • •
SOME STUDIES ON THE SPECIFICITY OF AMINO ACID ENTRY ROUTES IN PIGEON ERYTHROCYTES
AD-614 314 DIV. 16

•HAUROWITZ, FELIX
• • •
PEPTIDE MAPS OF ANTIBODIES AGAINST AN ANTIGEN CONTAINING TWO DIFFERENT DETERMINANT GROUPS.
AD-614 313 DIV. 16
• • •
COMPARISON OF THE PEPTIDE MAPS OF ANTI= BODIES AGAINST AN ACIDIC AND A BASIC DETERMINANT GROUP,
AD-614 218 DIV. 16

•HAUSER, C. R.
• • •
RING METALATION OF DIMETHYLAMINOMETHYLFERROCENE WITH BUTYLLITHIUM AND CONDENSATIONS WITH ELECTROPHILIC COMPOUNDS. SYNTHESIS OF 1,2-DISUBSTITUTED FERROCENES,
AD-614 544 DIV. 4

•HAUSER, J. R.
• • •
INTEGRATED SILICON DEVICE TECHNOLOGY. VOLUME VI. UNIPOLAR TRANSISTORS,
AD-613 951 DIV. 8

•HAYS, DAVID G.
• • •
ANNOTATED BIBLIOGRAPHY OF RAND PUBLICATIONS IN COMPUTATIONAL LINGUISTICS,
AD-613 975 DIV. 32

•HAYS, MARGUERITE T.
• • •
INFLUENCE OF THE GASTROINTESTINAL IODIDE CYCLE ON THE EARLY DISTRIBUTION OF RADIOACTIVE IODIDE IN MAN,
AD-614 185 DIV. 16

•HAZEL, W. C.
• • •
SATELLITE CONTROL FACILITY,

DESIGN CRITERIA: EXTENDING THE FREQUENCY RESPONSE OF THE REMOTE STATION TAPE RECORDER/REPRODUCER EQUIPMENT,
AD-614 003 DIV. 12

•HECKER, MICHAEL H. L.
• • •
ARTICULATION-TESTING METHODS: CONSONANTAL DIFFERENTIATION WITH A CLOSED-RESPONSE SET,
AD-614 336 DIV. 5

•HECKSHER, HELMUT
• • •
RELATIVE ADVANTAGES OF INTERFEROMETER OVER TELESCOPE FOR MEASURING SOURCE SIZES.
AD-614 298 DIV. 30

•HEDGCOCK, F. T.
• • •
ELECTRONIC STRUCTURE OF DILUTE SOLID SOLUTION ALLOYS OF 3D-TRANSITION METALS IN A NON-MAGNETIC MATRIX.
AD-614 482 DIV. 25

•HEIKES, R. R.
• • •
MAGNETIC AND ELECTRICAL ANOMALIES IN LACOO3,
AD-614 216 DIV. 25

•HEINRICH, H. G.
• • •
PARACHUTE STRESS ANALYSIS DURING INFLATION AND AT STEADY STATE,
AD-614 138 DIV. 1

•HELWIG, ELSON B.
• • •
DIFFERENTIATION OF NEVOID BASAL CELL CARCINOMA FROM EPITHELIOMA ADENOIDES SYSTICUM; A CLINICOPATHOLOGIC AND HISTOCHEMICAL STUDY,
AD-614 353 DIV. 16

•HENBRON, A. H.
• • •
A STUDY OF THE BEHAVIOR OF SOIL AND ROCK SUBJECTED TO HIGH STRESS LEVELS.
AD-614 481 DIV. 13

•HENSCHKE, RICHARD A.
• • •
MICROWAVE SOLID-STATE GENERATORS.
AD-614 047 DIV. 8

•HENSLEY, EUGENE B.
• • •
PHOTOELECTRIC EMISSION FROM BARIUM OXIDE,
AD-614 326 DIV. 25

•HENTSCHEL, J.
• • •
DEVELOPMENT OF AN X-BAND CW CROSSED-FIELD AMPLIFIER.
AD-614 251 DIV. 8

•HEROLD, LAURANCE C.
• • •
TRINCHERAS AND PHYSICAL ENVIRONMENT ALONG THE RIO GAVILAN, CHIHUAHUA, MEXICO.
AD-614 441 DIV. 2

•HEROUX, OLIVER
• • •
PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON COLD ACCLIMATION HELD AT INSTITUTO ANTARTICO ARGENTINO, BUENOS AIRES, AUGUST 5-7, 1959.
AD-614 146 DIV. 16

•HERRNEGGER, F.
• • •
SHOCK WAVES.
AD-614 059 DIV. 25

•HERRNEGGER, FRANZ
• • •
SOME PRACTICAL EXAMPLES OF ONE DIMENSIONAL UNSTEADY POTENTIAL FLOWS IN MGD.
AD-614 052 DIV. 25

•HERSHBERGER, WAYNE
• • •
SELF-EVALUATIONAL RESPONDING AND TYPOGRAPHICAL CUEING: TECHNIQUES FOR PROGRAMING SELF-INSTRUCTIONAL READING MATERIALS,
AD-614 316 DIV. 23

•HERSHBERGER, WAYNE A.
• • •
TYPOGRAPHICAL CUING IN CONVENTIONAL AND PROGRAMED TEXTS,
AD-614 317 DIV. 23

•HERZBERG, G.
• • •
IDENTIFICATION OF FREE RADICALS IN FLASH PHOTOLYSIS
AD-614 497 DIV. 25

•HESS, F. R.
• • •
A SHIPBOARD CABLE-HAULING SYSTEM FOR LARGE ELECTRICAL CABLES,
AD-614 071 DIV. 31

•HEYDING, R. D.
• • •
PHYSICAL PROPERTIES OF ALPHA AND GAMMA ARSENIC,
AD-614 506 DIV. 17

•HILL, L. S.
• • •
SOME COST ACCOUNTING PROBLEMS IN PERT COST,
AD-614 408 DIV. 26

•HINKLEY, E. D.
• • •
ELECTRICAL AND ELECTRO-OPTICAL PROPERTIES OF INTERFACE-ALLOY HETEROJUNCTIONS,
AD-614 320 DIV. 25

•HIRST, R. C.
• • •
A SIMPLIFIED PROCEDURE FOR THE ANALYSIS OF COMPLEX NUCLEAR MAGNETIC RESONANCE SPECTRA. II. THE ANALYSIS OF SYMMETRICAL TRIFLUOROBENZENE, THE AA'A''XX'X'' SYSTEM,
AD-614 507 DIV. 20

•HIRTH, J. P.
• • •
ON THE CONTACT ANGLE IN HETEROGENEOUS NUCLEATION UPON A SUBSTRATE,
AD-614 542 DIV. 25

•HODGES, J. C.
• • •
DIGITIZING RIOMETER SYSTEM.
AD-614 247 DIV. 30

•HOERMAN, K. C.
• • •
PHOSPHORESCENCE OF CALCIFIED TISSUES,
AD-614 210 DIV. 16
• • •
CHARACTERISTICS OF INSOLUBLE PROTEIN OF TOOTH AND BONE, I. FLUORESCENCE OF SOME ACIDIC HYDROLYTIC FRAGMENTS,
AD-614 211 DIV. 16

•HOFSTADTER, R.
• • •
ELECTRON SCATTERING ON NUCLEONS, THREEBODY NUCLEI, AND CA40,
AD-614 270 DIV. 20

•HOGGE, ARTHUR L., JR.
• • •
STUDIES ON ANTHRAX INFECTIONS IN IMMUNIZED GUINEA PIGS,
AD-614 321 DIV. 16

•HOIJER, DOROTHY J.
• • •
PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON COLD ACCLIMATION HELD AT INSTITUTO ANTARTICO ARGENTINO, BUENOS AIRES, AUGUST 5-7, 1959.
AD-614 146 DIV. 16

•HOLL, R. J.
• • •
CAVITY NUCLEAR REACTORS
AD-613 998 DIV. 21

•HOLMES, D.
• • •
CRITERIA FOR OPTICAL MASER AMPLIFIERS AND OSCILLATORS.
AD-614 209 DIV. 25

•HOLMES, F. A.
• • •
LONG LIFE CLOSED LOOP MHD RESEARCH AND DEVELOPMENT UNIT.
AD-614 458 DIV. 25

•HOLMES, GEORGE E.
• • •
THE NATURE OF ANTIBODIES FOLLOWING EXPERIMENTAL ARBOVIRUS INFECTION IN GUINEA PIGS,
AD-614 348 DIV. 16

•HOLSINGER, J. L.
• • •
DIGITAL COMMUNICATION OVER FIXED TIMECONTINUOUS CHANNELS WITH MEMORY, WITH SPECIAL APPLICATION TO TELEPHONE CHANNELS,
AD-614 110 DIV. 8

•HORDON, M. J.
• • •
THE DIMENSIONAL STABILITY OF SELECTED ALLOY SYSTEMS.
AD-613 931 DIV. 17

•HOROWITZ, JEROME E.
• • •
THE ELECTRONIC SYSTEMS DIVISION. RELIABILITY/MAINTAINABILITY PROGRAM ELEMENTS,
AD-614 423 DIV. 18

•HOUSE, ARTHUR S.
• • •
ARTICULATION-TESTING METHODS: CONSONANTAL DIFFERENTIATION WITH A CLOSED-RESPONSE SET,
AD-614 336 DIV. 5

•HSIA, YUN
• • •
MAINTAINING AN ABSOLUTE HUE IN THE PRESENCE OF DIFFERENT BACKGROUND COLORS,
AD-614 199 DIV. 16

•HUBEL, DAVID H.
• • •
CODING AND TRANSMISSION IN THE VISUAL SYSTEM.
AD-614 486 DIV. 16

•HUFF, MARGARET L.
• • •
STUDIES ON ANTHRAX INFECTIONS IN IMMUNIZED GUINEA PIGS,
AD-614 321 DIV. 16

•HUGGINS, ROBERT A.
• • •
GRAIN BOUNDARY SEGREGATION AND THE COLD WORK PEAK IN IRON CONTAINING CARBON OR NITROGEN,
AD-613 970 DIV. 17
• • •
INFLUENCE OF A FINELY DISPERSED SECOND PHASE ON RECRYSTALLIZATION,
AD-613 971 DIV. 17
• • •
STRUCTURE OF DEFORMED INTERNALLY OXIDIZED ALLOYS
AD-614 080 DIV. 17

•HUGHES, E. D.
• • •
THE REARRANGEMENT OF AROMATIC N-NITROAMINES. PART III. THE ACID-CATALYSED REARRANGEMENT OF N-NITROANILINE,
AD-614 215 DIV. 4

•HUGHES, RICHARD S.
• • •
SILICON P-N JUNCTIONS AS AUTOMATIC GAIN CONTROL (AGC) ELEMENTS FOR VIDEO PULSES
AD-614 280 DIV. 8

•HUNDSTAD, R. L.
• • •
LONG LIFE CLOSED LOOP MHD RESEARCH AND DEVELOPMENT UNIT.
AD-614 458 DIV. 25

•HUNGER, K.
• • •
THE ADIABATIC LINEAR STARK EFFECT IN A PLASMA,
AD-614 283 DIV. 25

•HWANG, C. F.
• • •
EXPERIMENTS ON DYNAMIC POLARIZATION OF PROTONS IN POLYETHYLENE BY THE 'SOLID EFFECT'. A PROPOSED POLARIZED PROTON TARGET,
AD-614 148 DIV. 20

•HYLLERAAS, EGIL A.
• • •
ON THE CONCEPTION OF GENERALIZED SPIN OF FREE DIRAC PARTICLES,
AD-614 219 DIV. 25

•ILLINGER, KARL H.
• • •
DIELECTRIC DISPERSION.
AD-613 933 DIV. 25

•ILYIN, I. B.
• • •
THE USD-1 DROBYSHEV UNIVERSAL STEREOGRAPH,
AD-614 107 DIV. 2

•INAMI, S. H.
• • •
THERMAL DIFFUSIVITY OF AMMONIUM PERCHLORATE,
AD-614 081 DIV. 25

•INFIELD, J. M.
• • •
MACHINING HIGH PURITY ALUMINA.
AD-614 467 DIV. 26

•IRVING, LAURENCE
• • •
PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON COLD ACCLIMATION HELD AT INSTITUTO ANTARTICO ARGENTINO, BUENOS AIRES, AUGUST 5-7, 1959.
AD-614 146 DIV. 16

•ISAACS, JOHN D.
• • •
DEVELOPMENT AND TESTING OF TAUT-NYLON MOORED INSTRUMENT STATIONS (WITH DETAILS OF DESIGN AND CONSTRUCTION),
AD-614 427 DIV. 2

•ISAKOV, D.
• • •
MARVELOUS ORBIT,
AD-614 025 DIV. 32

•ISHIMARU, AKIRA
• • •
DIPOLE EXCITED UNIDIRECTIONALLY CONDUCTING SPHERE.
AD-614 078 DIV. 8

•ISSI, JEAN-PAUL
• • •
QUENCHING AND POST-IRRADIATION STUDIES ON CDS SINGLE CRYSTALS. TRANSPORT PROPERTIES OF BISMUTH ROLLED THIN FOILS.
AD-614 485 DIV. 25

•ITO, KATSUHIKO
• • •
SOME NEW FREEZE PHOTOELASTIC MATERIALS AND THEIR APPLICATION
AD-614 278 DIV. 14

•IVANOV, A.
• • •
BIOLOGICAL WEAPONS,
AD-614 404 DIV. 3

•IVERONOVA, V. I.
• • •
X-RAY EXAMINATION OF THE ORDERING PROCESS IN ALLOYS
AD-614 387 DIV. 17

•JACKSON, JAMES D.
• • •
STRESS-CORROSION CRACKING OF ALUMINUM ALLOYS,
AD-613 957 DIV. 17

•JACOBS, J.
• • •
CRITERIA FOR OPTICAL MASER AMPLIFIERS AND OSCILLATORS.
AD-614 209 DIV. 25

•JACOBSON, L. A.
• • •
THE INVESTIGATION OF MICROSTRUCTURE IN STRUCTURAL CERAMICS,
AD-614 076 DIV. 14

•JACOBSON, M. J.
• • •
ANALYSIS OF SPREADING LOSS FOR REFRACTED/ REFLECTED RAYS IN CONSTANT-VELOCITY-GRADIENT MEDIA,
AD-614 196 DIV. 25

•JACOBSON, YORKE G.
• • •
IMPORTANCE OF PREVENTING RENAL VASCULAR COLLAPSE DURING PERIOD OF RENAL ISCHEMIA IN KIDNEY TRANSPLATATION,
AD-614 298 DIV. 16

•JAMES, W. J.
• • •
ELECTROCHEMICAL BEHAVIOR OF TIOX SOLID SOLUTIONS IN AQUEOUS HF AND HF-HCL MIXTURES.
AD-614 183 DIV. 4

•JAMISON, L. R. , JR.
• • •
PARACHUTE STRESS ANALYSIS DURING INFLATION AND AT STEADY STATE,
AD-614 138 DIV. 1

•JANKOWITZ, GERALD
• • •
DEVELOPMENT OF A CARBON DIOXIDE PARTIAL PRESSURE SENSOR.
AD-614 226 DIV. 16

•JARNAGIN, R. C.
• • •
PHOTOGENERATION OF FREE CARRIERS IN ORGANIC CRYSTALS VIA EXCITON-EXCITON INTERACTIONS
AD-614 385 DIV. 25

•JARVIS, N. L.
• • •
REDUCTION OF POLYMERIC FRICTION BY MINOR CONCENTRATIONS OF PARTIALLY FLUORINATED COMPOUNDS.
AD-614 059 DIV. 14

•JOHNSON, A. F.
• • •
ANIONIC POLYMERIZATION OF BUTADIENE AND STYRENE,
AD-614 498 DIV. 4

•JOHNSON, G. L.
• • •
DIGITIZING RIOMETER SYSTEM.
AD-614 247 DIV. 30

•JOHNSON, HAROLD L.
• • •
INFRARED PHOTOMETRY OF M-DWARF STARS,
AD-614 354 DIV. 2
• • •
MULTICOLOR PHOTOMETRY OF CARBON STARS,
AD-614 361 DIV. 2

•JOHNSON, K. M.
• • •
RELATIONSHIP OF RHINOVIRUS INFECTION TO MILD UPPER RESPIRATORY DISEASE. II. EPIDEMIOLOGIC OBSERVATIONS IN MALE MILITARY TRAINEES.
AD-614 305 DIV. 16
• • •
PATTERNS OF ADENOVIRUS INFECTIONS IN MARINE CORPS PERSONNEL. I. A 42-MONTH SURVEY IN RECRUIT AND NON-RECRUIT POPULATIONS. II. LONGITUDINAL STUDY OF SUCCESSIVE ADVANCED RECRUIT TRAINING COMPANIES.
AD-614 306 DIV. 16

•JOHNSON, ROCKNE H.
• • •
A PROGRAM FOR ROUTINE LOCATION OF TPHASE SOURCES IN THE PACIFIC.
AD-614 273 DIV. 2

•JONES, ALLAN W.
• • •
WATER AND ELECTROLYTE CONTENT OF NORMAL AND HYPERTENSIVE ARTERIES IN DOGS,
AD-614 361 DIV. 16

•JONES, K. SPARCK
• • •
SEMANTIC BASIS OF COMMUNICATION.
AD-614 093 DIV. 32

•JONES, R. G.
• • •
A SIMPLIFIED PROCEDURE FOR THE ANALYSIS OF COMPLEX

NUCLEAR MAGNETIC RESONANCE SPECTRA. II. THE ANALYSIS OF SYMMETRICAL TRIFLUOROBENZENE, THE AA'A''XX'X'' SYSTEM,
AD-614 507 DIV. 20

•JONES, R. NORMAN
• • •
INFRARED SPECTROSCOPY... WHERE DO WE GO FROM HERE.
AD-614 504 DIV. 25

•JONES, THOMAS H.
• • •
TEMPERATURE DEPENDENCE OF THE LIFETIME OF PHOSPHORESCENCE OF SOME POLYNUCLEAR HYDROCARBONS IN VISCOUS SOLUTION,
AD-614 930 DIV. 4

•JORDAN, E. L.
• • •
REACTOR INSTRUMENTATION RESPONSE TO INCORE VOID FORMATION.
AD-614 037 DIV. 20

•JORTNER, JOSHUA
• • •
GUEST-HOST INTERACTIONS: AN EXAMINATION OF THE SOLVENT-INDUCED SPECTRAL SHIFT IN A MODEL SYSTEM,
AD-614 289 DIV. 25

•KADANOFF, LEO P.
• • •
GREEN'S FUNCTIONS AND SUPERFLUID HYDRODYNAMICS,
AD-614 044 DIV. 25

•KADISON, RICHARD B.
• • •
A NOTE ON DERIVATIONS OF OPERATOR ALGEBRAS,
AD-613 926 DIV. 15

•KADISON, RICHARD V.
• • •
DERIVATIONS OF OPERATOR GROUP ALGEBRAS,
AD-613 927 DIV. 15
• • •
DERIVATIONS OF OPERATOR ALGEBRAS,
AD-613 928 DIV. 15

•KAGIWADA, H. H.
• • •
INVARIANT IMBEDDING AND A REFORMULATION OF THE INTERNAL INTENSITY PROBLEM IN TRANSPORT THEORY,
AD-614 031 DIV. 25

•KAHN, DAVID
• • •
PROPERTIES OF CONDUCTION ELECTRONS IN IONIC CRYSTALS.
AD-614 091 DIV. 25

•KAINZ, JOHANN J.
• • •
DETERMINATION OF RADIAL DISTRIBUTION OF VOLUME RADIANCE OF A LUMINOUS MEDIUM CONFINED IN A GLASS CYLINDER,
AD-614 328 DIV. 25

•KALABA, R. E.
• • •
INVARIANT IMBEDDING AND A REFORMULATION OF THE INTERNAL INTENSITY PROBLEM IN TRANSPORT THEORY,
AD-614 031 DIV. 25

•KALSER, SARAH C.
• • •
ATROPINE DETOXICATION DURING HYPOTHERMIA BY THE ISOLATED PERFUSED RAT LIVER.
AD-614 068 DIV. 16

•KANE, H.
• • •
A STUDY OF THE BEHAVIOR OF SOIL AND ROCK SUBJECTED TO HIGH STRESS LEVELS.
AD-614 481 DIV. 13

•KANE, JOSEPH W.
• • •
GREEN'S FUNCTIONS AND SUPERFLUID HYDRODYNAMICS,
AD-614 044 DIV. 25

•KANKI, TAKESHI
• • •
CROSSING RELATIONS AND LEGENDRE EXPANSIONS IN PION-PION SCATTERING,
AD-614 153 DIV. 20

•KANNELAUD, J.
• • •
HANLE EFFECT IN THE HE-NE LASER,
AD-614 360 DIV. 25

•KANODE, RALPH G.
• • •
STUDIES ON ANTHRAX INFECTIONS IN IMMUNIZED GUINEA PIGS,
AD-614 321 DIV. 16

•KAO, HSIAO C.
• • •
HYPERSONIC VISCOUS FLOW NEAR THE STAGNATION STREAMLINE OF A BLUNT BODY: I. A TEST OF LOCAL SIMILARITY.
AD-613 915 DIV. 9
• • •
HYPERSONIC VISCOUS FLOW NEAR THE STAGNATION STREAMLINE OF A BLUNT BODY: II. THIRD ORDER BOUNDARY-LAYER THEORY AND COMPARISON WITH OTHER METHODS.
AD-613 916 DIV. 9

•KASNER, W. H.
• • •
ELECTRON-ION RECOMBINATION IN NITROGEN,
AD-614 160 DIV. 2

•KATZ, ROBERT N.
• • •
THE USE OF THE CRITICAL THICKNESS CONCEPT IN DESIGN
AD-614 094 DIV. 27

•KATZENBACH, NICHOLAS DEB.
• • •
REPORT OF THE ATTORNEY GENERAL, PURSUANT TO SECTION 10(C) OF THE SMALL BUSINESS ACT OF 1958 AS AMENDED,
AD-614 474 DIV. 18

•KAUFMAN, JOYCE J.
• • •
THE EFFECT OF SUBSTITUTION ON THE IONIZATION POTENTIALS OF FREE RADICALS AND MOLECULES. VII. THEORETICAL RATIONALIZATION FOR DIFFERING CORRELATIONS FOUND FOR BOND DISSOCIATION ENERGIES WITH IONIZATION POTENTIALS AND ELECTRON AFFINITIES OF ORGANIC OR INORGANIC RADICALS
AD-613 922 DIV. 4
• • •
LCAO-MO SCF CALCULATIONS OF C606 SYSTEMS,
AD-614 192 DIV. 4

•KAUFMAN, LARRY
• • •
THERMODYNAMICS OF MARTENSITIC F. C. C. REVERSIBLY YIELDS B. C. C. AND F. C. C. REVERSIBLY YIELDS H. C. P. TRANSFORMATIONS IN THE IRONRUTHENIUM SYSTEM
AD-614 009 DIV. 17

•KAUFMAN, LAURENCE
• • •
ANALYTICAL STUDY OF THE THERMODYNAMIC FACTORS CONTROLLING DIAMOND SYNTHESIS AND GROWTH AT HIGH PRESSURES AND TEMPERATURES.
AD-614 082 DIV. 25

•KEATINGE, S.
• • •
STUDIES ON THE ROLE OF POTASSIUM IONS IN THE LETHAL TOXICITY OF STREPTOLYSIN O
AD-614 198 DIV. 16

•KECK, JAMES C.
• • •
CURRENT DISTRIBUTION IN A MAGNETIC ANNULAR SHOCK TUBE,
AD-614 212 DIV. 30

•KEEFE, T. J.
• • •
RESULTS OF SIMULTANEOUS ELF MEASUREMENTS AT BRANNENBURG GERMANY AND KINGSTON, R. I.
AD-614 012 DIV. 2

•KEILIN, G. S.
• • •
NEW 5KHGSVF FORGING STEEL
AD-614 390 DIV. 17

•KELLERS, C. F.
• • •
BEAMS OF HELIUM ATOMS AT TEMPERATURES BELOW 0.5 K,
AD-614 373 DIV. 25

•KELLY, ELIZABETH
• • •
THE EFFECT OF ULTRASOUND ON BIOLOGICAL TISSUE.
AD-614 370 DIV. 16

•KELLY, RONALD D.
• • •
TRANSDUCERS FOR SONIC FATIGUE MEASUREMENTS,
AD-613 946 DIV. 30

•KEOGH, JIM
• • •
INTERLAMINAR SHEAR OF FILAMENT-WOUND REINFORCED PLASTICS.
AD-613 997 DIV. 14

•KERALLA, J. A.
• • •
ZINC ELECTRODE INVESTIGATION.
AD-614 119 DIV. 7

•KERLEE, D. D.
• • •
COSMIC-RAY HEAVY NUCLEI AT THE GEOMAGNETIC EQUATOR
AD-614 549 DIV. 20

•KERNEY, K. P.
• • •
AN ESTIMATION LEMMA FOR LAMINAR COMPRESSIBLE BOUNDARY-LAYER VELOCITY PROFILES.
AD-614 159 DIV. 9

•KERSHNER, R. B.
• • •
THE TRANSIT SYSTEM,
AD-614 162 DIV. 19

•KESSEL, QUENTIN C.
• • •
CHARGE-STATE CORRELATIONS IN AR(+) -AR COLLISIONS,
AD-614 545 DIV. 25

*KEVORKIAN, H. K.
• • •
DIFFUSION IN ORGANIC CRYSTALS. I. SELFDIFFUSION IN ANTHRACENE,
AD-619 921 DIV. 25

*KHARE, S. P.
• • •
DIFFERENTIAL CROSS SECTIONS FOR ELECTRONS ELASTICALLY SCATTERED BY HELIUM ATOMS
AD-613 929 DIV. 20

*KIESOW, LUTZ
• • •
ON THE ASSIMILATION OF ENERGY FROM INORGANIC SOURCES IN AUTOTROPHIC FORMS OF LIFE
AD-619 299 DIV. 16

*KIKUCHI, T. T.
• • •
LASER POSSIBILITIES OF CHEMICALLY EXCITED MOLECULES FORMED WITH ATOMIC SPECIES
AD-619 224 DIV. 25

*KIM, Y. S.
• • •
THE PHI-OMEGA MIXING ANGLE,
AD-619 171 DIV. 20
• • •
SU(3) SYMMETRY AND THE NONLEPTONIC K-MESON PROCESSES
AD-619 172 DIV. 20
• • •
THREE-PARTICLE UNITARITY INTEGRAL,
AD-619 173 DIV. 25
• • •
UNITARY SYMMETRY AND NON-LEPTONIC K-DECAYS,
AD-619 175 DIV. 20

*KING, R. B.
• • •
CYCLOPENTADIENYLCOBALT CARBONYL DIIODIDE,
AD-619 540 DIV. 4

*KING, R. W. P.
• • •
VERY LOW FREQUENCY PROPAGATION; ELECTRON AND SOLID STATE PHYSICS; AUTOMATIC CONTROL; COMMUNICATIONS AND NETWORKS; ELECTROMAGNETIC RADIATION.
AD-619 130 DIV. 30

*KISSLINGER, L. S.
• • •
MAGNETIC DIPOLE MOMENTS OF ODD-MASS NUCLEI IN THE SPHERICAL REGION,
AD-619 496 DIV. 20

*KITAGAWA, TOYOKICHI
• • •
VOLTAMMETRY AND ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF HALONITROBENZENE ANION RADICALS,
AD-619 291 DIV. 4

*KJPKSHUS, A.
• • •
CONSTITUTION AND MAGNETIC AND ELECTRICAL PROPERTIES OF PALLADIUM TELLURIDES (PDTE-PDTE2),
AD-619 519 DIV. 17

*KLAPPER, JACOB
• • •
THEORY AND DESIGN OF FREQUENCY CONVERTERS USING COMBINATIONS OF PARAMETRIC ELEMENTS.
AD-619 122 DIV. 8

*KLEIN, MARK J.
• • •
INFLUENCE OF A FINELY DISPERSED SECOND PHASE ON RECRYSTALLIZATION,
AD-613 971 DIV. 17

*KLEINMAN, R. E.
• • •
DIFFRACTION AND SCATTERING BY REGULAR BODIES.
AD-619 046 DIV. 8

*KNIGHT, KATHERINE L.
• • •
PEPTIDE MAPS OF ANTIBODIES AGAINST AN ANTIGEN CONTAINING TWO DIFFERENT DETERMINANT GROUPS.
AD-619 313 DIV. 16

*KNOBLOCK, EDWARD C.
• • •
COULOMETRIC DETERMINATION OF PROTEIN NITROGEN,
AD-619 341 DIV. 16
• • •
USE OF HIGHLY ACID SUPPORTING ELECTROLYTES IN POLAROGRAPHY. OBSERVED CHANGES IN POLAROGRAPHIC WAVES OF SELENIUM (IV) UPON STANDING,
AD-619 382 DIV. 4

*KNOCHEL, JAMES P.
• • •
THAM DIALYSIS: AN EXPERIMENTAL METHOD TO STUDY DIFFUSION OF CERTAIN WEAK ACIDS IN VIVIO. II. SECOBARBITAL,
AD-619 355 DIV. 16

*KNODLE, WILLIAM C.
• • •
A COMPUTER PROGRAM FOR FORECASTING THE WIND DRIFT OF SEA ICE.
AD-619 255 DIV. 2

*KNOEDLER, DAVID
• • •
DENTAL OBSERVATIONS MADE WHILE WINTERING IN ANTARCTICA IN 1956-1957.
AD-619 315 DIV. 16

*KOBRINSKII, A. E.
• • •
A SELF-ADJUSTING SYSTEM
AD-619 022 DIV. 30

*KOHLER, D.
• • •
RADIATIVE CAPTURE OF HE3 BY LI7,
AD-619 515 DIV. 20

*KOLESAR, D. F.
• • •
ELASTIC CONSTANTS OF HGTE,
AD-619 308 DIV. 25

*KOLESAR, PETER J.
• • •
OPTIMAL RANDOMIZED REPLACEMENT UNDER MARKOVIAN DETERIORATION.
AD-619 120 DIV. 26

*KOLMER, HAROLD S. , JR.
• • •
MODES OF COMMUNICATION USED BY MILITARY PATIENTS DIAGNOSED AS SCHIZOPHRENIC (ACUTE), AS ALCOHOLIC (CHRONIC) AND BY MILITARY OFFENDERS (AWOL),
AD-619 562 DIV. 28

*KONTIS, A. L.
• • •
A STUDY OF AEROMAGNETIC DATA, NEW ENGLAND SEAMOUNT AREA,
AD-619 117 DIV. 2

*KONTOS, DONNA K.
• • •
THREAT PERCEPTION AND CIVIL DEFENSE,
AD-619 386 DIV. 18

*KOO, WILLIAM H.
• • •
THE BAUSCHINGER EFFECT IN A HIGH STRENGTH STEEL.
AD-619 115 DIV. 17

*KOOI, C. F.
• • •
EVIDENCE OF UNPINNED SURFACE SPINS FROM PARALLEL SPIN-WAVE RESONANCES IN PERMALLOY FILMS,
AD-619 359 DIV. 25

*KORENDYASEV, A. I.
• • •
A SELF-ADJUSTING SYSTEM
AD-619 022 DIV. 30

*KORFF, D.
• • •
SU(3) SYMMETRY AND THE NONLEPTONIC K-MESON PROCESSES
AD-619 172 DIV. 20

*KORNBERG, H. L.
• • •
THE METABOLISM OF SIMPLE CARBON COMPOUNDS IN MICRO-ORGANISMS.
AD-619 479 DIV. 16

*KORNEGAY, W. M.
• • •
CALIBRATION OF A PRESSURE SENSOR FOR MEASUREMENTS IN CONTINUUM AND RAREFIED GAS FLOWS,
AD-619 424 DIV. 30

*KOSTERNIN, E. A.
• • •
VITRIFIED LIQUID-CRYSTAL FILMS,
AD-613 986 DIV. 25

*KOSTYUKOV, D. V.
• • •
ULTRASONIC FLAW DETECTOR
AD-619 397 DIV. 30

*KRIENKE, O. K. , JR.
• • •
COSMIC-RAY HEAVY NUCLEI AT THE GEOMAGNETIC EQUATOR
AD-619 549 DIV. 20

*KRIMIGIS, S. M.
• • •
AN INTERPLANETARY DIFFUSION MODEL FOR THE TIME BEHAVIOR OF INTENSITY IN A SOLAR COSMIC RAY EVENT,
AD-619 100 DIV. 2

*KRUEGER, T. K.
• • •
TABLE OF HARTREE-FOCK SELF CONSISTENT FIELD WAVE FUNCTIONS WITH EXCHANGE,
AD-619 428 DIV. 2

*KRUPEN, PHILIP
• • •
MEASUREMENT OF ELECTROSTATIC CHARGE ON AIRCRAFT,
AD-619 060 DIV. 1

*KRYTER, K. D.
• • •
ARTICULATION-TESTING METHODS: CONSONANTAL DIFFERENT

IATION WITH A CLOSED-RESPONSE
SFT,
AD-614 336 DIV. 5

•KRZYCKI, LEROY J.
• • •
THE EFFECT OF AN INTENSE
MAGNETIC FIELD ON ROCKET NOZZLE
HEAT TRANSFER. PART 1: THEORY
AND SUPERCONDUCTING MAGNET
EXPERIMENTS.
AD-613 992 DIV. 27

•KUKILOVSKII, A. G.
• • •
THE BOUNDARY LAYER ON
A FLAT PLATE IN ANISOTROPIC
MAGNETOHYDRODYNAMICS,
AD-614 391 DIV. 25

•KUNTZ, ROBERT E.
• • •
THE LUNG WORM ANGIOSTRONGYLUS
CANTONENSIS OF RODENTS ON
TAIWAN (FORMOSA) AND THE OFF
SHORE ISLANDS,
AD-614 300 DIV. 16
• • •
A MONOGENETIC AND SEVEN
DIGENETIC TREMATODES OF AMPHIBIANS
AND REPTILES FROM PALAWAN
ISLAND, PHILIPPINES,
AD-614 302 DIV. 16

•KUPREVICH, N. F.
• • •
EXPERIMENTS IN TELEVISION
PHOTOGRAPHY OF THE MOON IN
THE 0.8-1.1 AND 0.8-2.3 MICRON
RANGE,
AD-614 395 DIV. 2

•KURKE, LEWIS
• • •
MODES OF COMMUNICATION
USED BY MILITARY PATIENTS
DIAGNOSED AS SCHIZOPHRENIC
(ACUTE), AS ALCOHOLIC (CHRONIC)
AND BY MILITARY OFFENDERS
(AWOL),
AD-614 562 DIV. 28

•KUSHNEREVSKII, YU. V.
• • •
IRREGULARITY STRUCTURE
AND MOVEMENT IN THE IONOSPHERE
(SELECTED PASSAGES),
AD-613 982 DIV. 2

•LARES, M. M.
• • •
DIFFUSION IN ORGANIC
CRYSTALS. I. SELFDIFFUSION
IN ANTHRACENE,
AD-614 521 DIV. 25

•LANDER, J. J.
• • •
ZINC ELECTRODE INVESTIGATION.
AD-614 119 DIV. 7

•LANGWAY, CHESTER C., JR.
• • •
SOME CHARACTERISTICS
OF BLACK SPHERULES,
AD-614 188 DIV. 2

•LARENZ, R. W.
• • •
THE ADIABATIC LINEAR
STARK EFFECT IN A PLASMA,
AD-614 289 DIV. 25

•LARGENT, J. R.
• • •
A THREE-WATT LOW-NOISE
TRAVELING-WAVE TUBE FOR C-
BAND.
AD-614 125 DIV. 8

•LARSEN, JAMES A.
• • •
THE ROLE OF PHYSIOLOGY
AND ENVIRONMENT IN THE DISTRIBUTION
OF ARCTIC PLANTS,
AD-614 079 DIV. 2

•LAURENT, PIERRE
• • •
PHOTOELASTICITY: PRINCIPLES,
METHODS AND APPLICATIONS TO
MATERIALS TESTING, METALLURGY
AND MECHANICS, PARTS I, II,
III,
AD-614 282 DIV. 30

•LAWRENCE, R. A.
• • •
AN INVESTIGATION OF THE
THERMAL RESPONSE OF THE AEROSPACE
SHIELD TEST REACTOR TO LOSS
OF COOLANT.
AD-614 492 DIV. 20

•LAYLOFF, THOMAS
• • •
CORRELATION OF SOLVENT
EFFECTS ON ELECTRON PARAMAGNETIC
RESONANCE SPECTRA OF THE NITRO
BENZENE ANION RADICAL,
AD-613 924 DIV. 4

•LAYLOFF, THOMAS P.
• • •
VOLTAMMETRY AND ELECTRON
PARAMAGNETIC RESONANCE SPECTRA
OF HALONITROBENZENE ANION
RADICALS.
AD-614 291 DIV. 4

•LEBOVITZ, NORMAN R.
• • •
ON THE OSCILLATIONS OF
THE MACLAURIN SPHEROID BELONGING
TO THE THIRD HARMONICS,
AD-614 155 DIV. 2
• • •
ON THE STABILITY OF THE
JACOBI ELLIPSOIDS,
AD-614 156 DIV. 2
• • •
NON-RADIAL OSCILLATIONS
OF GASEOUS MASSES.
AD-614 330 DIV. 2

•LECAM, LUCIEN
• • •
CONSISTENT ESTIMATES
AND ZERO-ONE SETS.
AD-613 917 DIV. 15

•LECOMTE, J.
• • •
RESEARCH ON BASIC FAR-
INFRARED TECHNIQUES.
AD-613 966 DIV. 30

•LEE, C. H.
• • •
DIFFUSION IN ORGANIC
CRYSTALS. I. SELFDIFFUSION
IN ANTHRACENE,
AD-614 521 DIV. 25

•LEE, JAMES B.
• • •
THE EFFECT OF AN INTENSE
MAGNETIC FIELD ON ROCKET NOZZLE
HEAT TRANSFER. PART 1: THEORY
AND SUPERCONDUCTING MAGNET
EXPERIMENTS.
AD-613 992 DIV. 27

•LEE, K. S. H.
• • •
ANTENNA RADIATION IN
A MOVING DISPERSIVE MEDIUM
AD-614 279 DIV. 8

•LEE, T. H.
• • •
COMPLEX POISSON'S RATIO
AND DILATATION CONSTANTS FROM
FORCED VIBRATION OF A SPHERE
AD-614 461 DIV. 25

•LEE, T. T.
• • •
A STUDY OF EFFECTIVE
FENDER SYSTEMS FOR NAVY PIERS
AND WHARVES.
AD-613 940 DIV. 13

•LEFFLER, J. E.
• • •
ARYL BORON FREE RADICALS
AD-614 547 DIV. 4

•LEONAS, V. B.
• • •
OBTAINING INTENSIVE MOLECULAR
BEAM,
AD-614 393 DIV. 30

•LEUNG, YAN-CHOK
• • •
A NOTE ON THE SIGNATURES
OF THE DOMINANT REGGE TRAJECTORIES
AD-614 537 DIV. 20

•LEVKOVSKII, E. I.
• • •
A SELF-ADJUSTING SYSTEM
AD-614 022 DIV. 30

•LEVY, MILTON
• • •
A STUDY OF THE EFFECT
OF HEAT TREATMENT ON THE MICRO
STRUCTURE AND PROPERTIES OF
SPRAYED MOLYBDENUM,
AD-614 127 DIV. 26

•LEWIS, B. L.
• • •
STUDY OF SPECIAL BEAMSHAPING
ANTENNAS.
AD-613 932 DIV. 8

•LIHL, F.
• • •
INVESTIGATORS OF THE
SYSTEMS Y-MN, GD-MN AND SM-
MN,
AD-614 462 DIV. 17
• • •
THE COMPOUNDS DYMN2,
HOMN2 AND ERMN2. CALCULATION
OF THE ENERGY AND FREE ENTHALPY
OF FORMATION OF RE-MERCURY-
COMPOUNDS BY VAPOUR PRESSURE
MEASUREMENTS AND THERMAL ANALYSIS
AD-614 463 DIV. 25
• • •
A SINTER PROCESS, USING
MERCURY AS AN 'AUXILIARY COMPONENT'
AS APPLIED TO RE-MN SYSTEMS.
(A SUMMARIZING DISCUSSION).
DIFFERENTIAL-THERMAL-AND MAGNETO-
THERMALANALYSIS OF THE SYSTEM
GD-MN (0 -50 W.% MN),
AD-614 464 DIV. 17
• • •
THEORIES OF THE DIFFERENTIAL-
THERMAL-RESP. MAGNETO-THERMAL-
ANALYSIS. A DETAILED DESCRIPTION
OF THE TWO APPARATUS AND OF
FURTHER MEASUREMENTS ON RE-
MN-ALLOYS,
AD-614 465 DIV. 17
• • •
X-RAY-, DTA-AND THERMO-
MAGNETICAL ANALYSIS OF Y,
SM, GD, DY, HO, ER-MN-COMPOUNDS
AD-614 466 DIV. 17

•LIN, CHI W.
• • •
THE VELOCITY FIELD DOWNSTREAM
FROM A TWODIMENSIONAL MODEL
HILL. PART 1.
AD-614 067 DIV. 9

•LIN, SHENG HSIEN
• • •
REACTION KINETICS, THE

THEORY OF LIQUIDS, AND OPTICAL ROTATION.
AD-614 083 DIV. 4

•LINSLEY, J.
• • •
ISOTROPY OF COSMIC RADIATION
AD-614 381 DIV. 2

•LIPETZ, LEO E.
• • •
INFORMATION PROCESSING IN THE FROG'S RETINA.
AD-614 249 DIV. 16

•LISTOV, K. M.
• • •
RADIO AND RADAR TECHNOLOGY AND ITS APPLICATION,
AD-613 969 DIV. 5

•LIU, F. F.
• • •
PHOTODISINTEGRATION OF THE DEUTERON BY POLARIZED PHOTONS,
AD-614 276 DIV. 20

•LIVINGSTON, ROBERT
• • •
TEMPERATURE DEPENDENCE OF THE LIFETIME OF PHOSPHORESCENCE OF SOME POLYNUCLEAR HYDROCARBONS IN VISCOUS SOLUTION,
AD-614 530 DIV. 4

•LOCKHART, L. B., JR.
• • •
DETERMINATION OF RADON CONCENTRATION IN THE AIR THROUGH MEASUREMENT OF ITS SOLID DECAY PRODUCTS.
AD-613 943 DIV. 20
• • •
THE PRESENT STATUS OF CHEMICAL RESEARCH IN ATMOSPHERE PURIFICATION AND CONTROL ON NUCLEAR-POWERED SUBMARINES.
AD-614 261 DIV. 31

•LOEB, H. L.
• • •
GENERALIZED RATIONAL APPROXIMATION,
AD-614 528 DIV. 19

•LOEV, DAVID
• • •
THE EVALUATION OF TECHNIQUES AND DEVICES AS APPLIED TO PROBLEM SOLVING.
AD-614 228 DIV. 30

•LOGEROT, J. M.
• • •
BERYLLIUM RESEARCH AND DEVELOPMENT PROGRAM. VOLUME VI. INFLUENCE OF THE DISTRIBUTION OF OXIDE AND THE TOTAL IMPURITY LEVEL ON RECRYSTALLIZATION AND GRAIN GROWTH OF BERYLLIUM.
AD-613 952 DIV. 17

•LORD, J. J.
• • •
COSMIC-RAY HEAVY NUCLEI AT THE GEOMAGNETIC EQUATOR
AD-614 949 DIV. 20

•LORDI, JOHN A.
• • •
TECHNIQUES FOR SOLVING NONEQUILIBRIUM EXPANDING FLOW PROBLEMS.
AD-614 457 DIV. 9

•LOSSING, F. P.
• • •
FREE RADICALS BY MASS SPECTROMETRY. XXXII. THERMAL DECOMPOSITION OF CYCLOPENTYL RADICALS,
AD-614 505 DIV. 4

•LOVE, C. M.
• • •
PHYSICAL, CHEMICAL AND BIOLOGICAL DATA FROM THE NORTHEAST PACIFIC OCEAN: COLUMBIA RIVER EFFLUENT AREA, JULY-AUGUST 1961,
AD-614 456 DIV. 2

•LOVELACE, C.
• • •
PRACTICLE THEORY OF THREE-PARTICLE STATES. I. NONRELATIVISTIC,
AD-614 493 DIV. 20

•LOWRY, IRA S.
• • •
A SHORT COURSE IN MODEL DESIGN,
AD-614 413 DIV. 30

•LOWRY, J. F.
• • •
PHOTOIONIZATION CROSS SECTION OF HELIUM IN THE 100- TO 250-A REGION,
AD-614 533 DIV. 25

•LUCKHAM, DAVID C.
• • •
INVESTIGATION OF THE THEORY OF ALGORITHMS WITH EMPHASIS ON PROGRAM SIMPLIFICATION.
AD-614 287 DIV. 30

•LUEBKE, WILLIAM R.
• • •
HIGH POWER X-BAND GENERATOR.
AD-614 001 DIV. 8

•LUGT, HANS J.
• • •
SOME RECENT DEVELOPMENTS IN THE THEORY OF VISCOUS FLUID FLOW WITH TECHNOLOGICAL AND GEOPHYSICAL APPLICATIONS,
AD-614 429 DIV. 9

•LUYCKX, ANDRE
• • •
QUENCHING AND POST-IRRADIATION STUDIES ON CDS SINGLE CRYSTALS. TRANSPORT PROPERTIES OF BISMUTH ROLLED THIN FOILS.
AD-614 488 DIV. 25

•LUYTEN, WILLEM J.
• • •
PROPER MOTIONS FOR EIGHTY WIDE DOUBLE STARS,
AD-614 135 DIV. 2

•LYUBIMOV, G. A.
• • •
THE BOUNDARY LAYER ON A FLAT PLATE IN ANISOTROPIC MAGNETOHYDRODYNAMICS,
AD-614 391 DIV. 25

•MAASS, W. S. G.
• • •
PHENOLIC ACIDS AND LIGNINS IN THE LYCOPODIALES,
AD-614 513 DIV. 4

•MADANSKY, ALBERT
• • •
SOME RESULTS AND PROBLEMS IN STOCHASTIC LINEAR PROGRAMMING
AD-613 990 DIV. 15

•MADEY, T. E.
• • •
THERMAL DESORPTION OF SR FROM W,
AD-614 142 DIV. 25

•MAHR, HERBERT
• • •
EXCITON ABSORPTION IN THE PRESENCE OF EXCITED F-CENTERS,
AD-614 487 DIV. 25

•MAJEROTTO, WALTER
• • •
THE HISTORICAL DEVELOPMENT OF THE SPINOR THEORY IN THE RIEMANNIAN GEOMETRY (SURVEY ON THE PUBLISHED LITERATURE)
AD-614 049 DIV. 25

•MALATESTA, LAMBERTO
• • •
NEW TRIPHENYLPHOSPHINE HYDRIDES OF RHENIUM (NUOVI IDRURI TRIFENILFOSFINICI DI RENIO),
AD-614 207 DIV. 4

•MALINKA, A. V.
• • •
ULTRASONIC FLAW DETECTOR
AD-614 397 DIV. 30

•MANCEWICZ, SANDRA A.
• • •
PHOSPHORESCENCE OF CALCIFIED TISSUES,
AD-614 210 DIV. 16
• • •
CHARACTERISTICS OF INSOLUBLE PROTEIN OF TOOTH AND BONE. I. FLUORESCENCE OF SOME ACIDIC HYDROLYTIC FRAGMENTS,
AD-614 211 DIV. 16

•MANTHEI, JAMES H.
• • •
USE OF ISOPROTERENOL AND PHENOXYBENZAMINE IN TREATMENT OF ENDOTOXIN SHOCK,
AD-614 266 DIV. 16

•MANY, A.
• • •
TUNNELING PROCESSES ACROSS THE OSELECTROLYTE INTERFACE
AD-614 494 DIV. 25

•MARKOWITZ, HARRY M.
• • •
PROGRAMMING BY QUESTIONNAIRE
AD-613 976 DIV. 30

•MARSHALL, P. A., JR.
• • •
MACHINING HIGH PURITY ALUMINA.
AD-614 467 DIV. 26

•MARTIN, DOUGLAS L.
• • •
DEVIATIONS OF THE SPECIFIC HEATS OF THE ALKALI METALS FROM HARMONIC BEHAVIOUR. A POSSIBLE DEPENDENCE ON ISOTOPIC COMPOSITION OF THE ANHARMONIC CONTRIBUTION TO SPECIFIC HEAT
AD-614 503 DIV. 25
• • •
THE SPECIFIC HEATS BELOW 320K OF POTASSIUM, RUBIDIUM AND CAESIUM,
AD-614 520 DIV. 25

•MARTIN, MARCEL A.
• • •
DIGITAL FILTERS FOR DATA PROCESSING,
AD-614 033 DIV. 30

•MARTIN, W. G.
• • •
N-ACETYL GROUPS IN VITELLENIN
AD-614 514 DIV. 16

•MARVIN, URSULA B.
• • •
SOME CHARACTERISTICS OF BLACK SPHERULES,

AD-614 188 DIV. 2

•MASON, J. K.
• • •
DIFFERENTIATION OF NEVOID BASAL CELL CARCINOMA FROM EPITHELIOMA ADENOIDES SYSTICUM; A CLINICOPATHOLOGIC AND HISTOCHEMICAL STUDY,
AD-614 353 DIV. 16

•MASON, JOHN G.
• • •
THE OXIDATION OF ARSENIC (III) AND ANTIMONY (III).
AD-614 476 DIV. 4

•MASSELL, B. F.
• • •
A NEW LOOK AT CUSTOMS UNION THEORY,
AD-614 407 DIV. 32

•MAST, LARRY T.
• • •
GROWTH OF AUTOMATION IN PRELAUNCH CHECKOUT FOR SPACE VEHICLES,
AD-614 410 DIV. 12

•MATES, ROBERT E.
• • •
TECHNIQUES FOR SOLVING NONEQUILIBRIUM EXPANDING FLOW PROBLEMS.
AD-614 457 DIV. 9

•MATHER, JOHN R.
• • •
COASTAL STORMS OF THE EASTERN UNITED STATES,
AD-614 189 DIV. 2

•MATHESON, A. T.
• • •
A RIBOSOMAL PEPTIDASE FROM ESCHERICHIA COLI B,
AD-614 521 DIV. 16

•MATTENSON, WALLACE O.
• • •
DEVELOPMENT OF A CRASHWORTHY, ARMORED, UNIVERSAL CREW SEAT FOR U. S. ARMY AIRCRAFT.
AD-614 231 DIV. 1

•MAYOR, JAMES W. , JR.
• • •
THE MECHANICAL AND CHEMICAL PROPERTIES OF THE HY 100 PRESSURE HULLS OF THE SUBMARINE, ALVIN.
AD-614 011 DIV. 31

•MAYROIDES, J. G.
• • •
ELASTIC CONSTANTS OF HGTE,
AD-614 308 DIV. 25

•MAYROIDES, JOHN G.
• • •
OBSERVATION OF INTERBAND TRANSITIONS IN ANTIMONY,
AD-614 312 DIV. 25

•MAY, JOEL
• • •
SIGNAL DISTORTION IN A FREQUENCY DIVIDER,
AD-614 425 DIV. 8

•MAZELSKY, R.
• • •
MAGNETIC AND ELECTRICAL ANOMALIES IN LACOO3,
AD-614 216 DIV. 25

•MCCARTY, G. S. , JR.
• • •
PRODUCTS BETWEEN HOMOTOPY GROUPS AND THE J-MORPHISM
AD-614 157 DIV. 15

•MCCLENATHAN, JAMES E.
• • •
IMPORTANCE OF PREVENTING RENAL VASCULAR COLLAPSE DURING PERIOD OF RENAL ISCHEMIA IN KIDNEY TRANSPLATATION,
AD-614 298 DIV. 16

•MCDAVID, W. L.
• • •
TABLE OF HARTREE-FOCK SELF CONSISTENT FIELD WAVE FUNCTIONS WITH EXCHANGE.
AD-614 428 DIV. 2

•MCDONALD, D. F.
• • •
INVESTIGATION OF THE STATISTICS OF BREAKDOWN USING NANOSECOND PULSE TECHNIQUES.
AD-614 286 DIV. 2

•MCDONALD, D. G.
• • •
PHYSIOLOGICAL CORRELATES OF MENTAL DISEASE,
AD-614 148 DIV. 16

•MCDONALD, RICHARD N.
• • •
NONBENZENOID AROMATIC SYSTEMS. I. SYNTHESIS OF 1-VINYLAZULENE AND CERTAIN SUBSTITUTED 1-VINYLAZULENES
AD-614 491 DIV. 4

•MCDOWELL, H. L.
• • •
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-613 994 DIV. 8
• • •
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-613 995 DIV. 8
• • •
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-614 059 DIV. 8

•MCGANN, VIRGINIA G.
• • •
STUDIES ON ANTHRAX INFECTIONS IN IMMUNIZED GUINEA PIGS,
AD-614 321 DIV. 16

•MCGEE, VICTOR E.
• • •
SEMANTIC COMPONENTS OF THE QUALITY OF PROCESSED SPEECH
AD-614 147 DIV. 28

•MCGINN, JAMES W. , JR.
• • •
AN EFFICIENCY FUNCTION FOR RATING MECHANICAL SCAN-TRACK RADARS,
AD-614 477 DIV. 6

•MCGLYNN, S. P.
• • •
PHOTOCONDUCTIVITY OF ANTHRACENE,
AD-614 197 DIV. 25

•MCLAUGHLIN, DONALD
• • •
REACTION KINETICS, THE THEORY OF LIQUIDS, AND OPTICAL ROTATION.
AD-614 083 DIV. 4

•MCTIGUE, JOHN W.
• • •
OCULAR COMPLICATIONS OF STEROID THERAPY,
AD-614 186 DIV. 16

•MCWHIRTER, J. W.
• • •
COMPUTER CODES FOR REACTOR AND HAZARD ANALYSES AT NARF,
AD-613 983 DIV. 30

•MELANKHOLIN, N. M.
• • •
TYPE OF GROWTH AND PROPERTIES OF LIQUID CRYSTALS OF THIAZINE DYES,
AD-613 985 DIV. 25

•MELLANBY, JANE
• • •
THE ROLE OF GANGLIOSIDE IN THE MODE OF ACTION OF TETANUS TOXIN,
AD-614 202 DIV. 16

•MELLOR, JOHN
• • •
NEUTRON DIFFRACTION STUDIES OF THE ORDER OF THE ATOMS IN THE P PHASE AND THE R PHASE
AD-614 149 DIV. 25

•MELNIK, ROBERT E.
• • •
A CONICAL THIN-SHOCK-LAYER THEORY UNIFORMLY VALID IN THE ENTROPY LAYER,
AD-614 444 DIV. 9

•MENDOZA, EUGENIO E. , V.
• • •
MULTICOLOR PHOTOMETRY OF CARBON STARS,
AD-614 361 DIV. 2

•MENYUK, N.
• • •
MAGNETIC PROPERTIES OF V(3+) IONS IN CUBIC SPINELS
AD-614 319 DIV. 25

•MERMIN, N. DAVID
• • •
GROUND STATE OF AN ELECTRON GAS IN A MAGNETIC FIELD,
AD-614 254 DIV. 25

•MERRITT, JOHN A. , JR.
• • •
METHYLENE BLUE IN THE TREATMENT OF DECABORANE TOXICITY
AD-614 333 DIV. 16

•MERTZ, P.
• • •
IMPULSE NOISE AND ERROR PERFORMANCE IN DATA TRANSMISSION
AD-614 416 DIV. 5

•METCALF, F. T.
• • •
EQUIVALENCE OF CERTAIN INEQUALITIES COMPLEMENTING THOSE OF CAUCHY-SCHWARZ AND HOLDER,
AD-614 158 DIV. 15

•MEYER, D. T.
• • •
BEAMS OF HELIUM ATOMS AT TEMPERATURES BELOW 0.5 K,
AD-614 373 DIV. 25

•MEYER, H.
• • •
BEAMS OF HELIUM ATOMS AT TEMPERATURES BELOW 0.5 K,
AD-614 373 DIV. 25

•MEYER, HORST
• • •
DENSITY OF LIQUID HELIUM-3 BETWEEN 0.04S AND 1.3K,
AD-614 376 DIV. 4

•MEYER, RICHARD A.
• • •
INDUCED RADIOACTIVITY IN FOOD AND ELECTRON STERILIZATION
AD-613 950 DIV. 29

•MEYER-ARENDT, JURGEN R.
• • •
OPTICAL SCINTILLATION; A SURVEY OF THE LITERATURE
AD-614 056 DIV. 2

•MICHEL, HARRY O.
• • •
REACTIONS OF ISOPROPYL METHYLPHOSPHONOFLUORIDATE WITH SUBSTITUTED PHENOLS. II.
AD-614 304 DIV. 4

•MICHENAUD, JEAN-PIERRE
• • •
QUENCHING AND POST-IRRADIATION STUDIES ON CDS SINGLE CRYSTALS. TRANSPORT PROPERTIES OF BISMUTH ROLLED THIN FOILS.
AD-614 485 DIV. 25

•MIDTDAL, JOHN
• • •
THE GENERAL ORTHOGONALITY THEOREM IN THE HYLLERAAS-SCHERR-KNIGHT VARIATIONAL PERTURBATION METHOD,
AD-614 220 DIV. 25

•MIKUMO, TAKESHI
• • •
CRUSTAL STRUCTURE IN CENTRAL CALIFORNIA IN RELATION TO THE SIERRA NEVADA,
AD-614 352 DIV. 2

•MILES, J. K.
• • •
DEVELOPMENT AND APPLICATION OF NUCLEAR MEASUREMENT TECHNIQUES.
AD-614 109 DIV. 16

•MILLER, R. C.
• • •
MAGNETIC AND ELECTRICAL ANOMALIES IN LACOO3,
AD-614 216 DIV. 25

•MILLIGAN, REX V.
• • •
THE BAUSCHINGER EFFECT IN A HIGH STRENGTH STEEL.
AD-614 115 DIV. 17

•MILTON, ROY C.
• • •
RANK ORDER PROBABILITIES: TWO-SAMPLE NORMAL SHIFT ALTERNATIVES,
AD-614 131 DIV. 15

•MININA, V. P.
• • •
USE OF SHADOWGRAPH MEASUREMENTS FOR QUALITATIVE RESEARCH OF A SUPERSONIC FLOW AROUND A WING PROFILE,
AD-614 389 DIV. 9

•MINSK, L. D.
• • •
SURVEY OF SNOW AND ICE REMOVAL TECHNIQUES,
AD-614 431 DIV. 33

•MINZNER, RAYMOND A.
• • •
MODEL ATMOSPHERES DETERMINED BY ABSORPTION OF SOLAR RADIATION
AD-614 085 DIV. 2

•MIRKOTAN, S. F.
• • •
IRREGULARITY STRUCTURE AND MOVEMENT IN THE IONOSPHERE (SELECTED PASSAGES),
AD-613 982 DIV. 2

•MOAZED, K. L.
• • •
ON THE CONTACT ANGLE IN HETEROGENEOUS NUCLEATION UPON A SUBSTRATE,
AD-614 542 DIV. 25

•MOHRAZ, B.
• • •
A STUDY OF THE BEHAVIOR OF SOIL AND ROCK SUBJECTED TO HIGH STRESS LEVELS.
AD-614 481 DIV. 13

•MOLCHANOV, A. P.
• • •
OBSERVATIONAL DATA FROM THE ANNULAR SOLAR ECLIPSE OF 31 JULY 1962,
AD-613 978 DIV. 2
• • •
USE OF RADIO DATA TO DETERMINE THE POSITION OF THE REGION IN WHICH THE CHARACTERISTICS OF THE SOLAR ATMOSPHERE CHANGE RAPIDLY,
AD-613 981 DIV. 2

•MOLENDA, ROBERT P.
• • •
ELECTRON SPIN RESONANCE CHARACTERISTICS OF SOME NORMAL TISSUES: EFFECT OF MICROWAVE POWER,
AD-614 249 DIV. 16

•MOLLER, K. D.
• • •
RESONANT FREQUENCY MIXING EFFECTS IN DISTRIBUTED MEDIA.
AD-614 208 DIV. 25

•MORDUCHOW, MORRIS
• • •
A NOTE ON VIBRATIONS OF A BEAM ON AN ELASTIC FOUNDATION
AD-614 072 DIV. 13

•MORICEAU, J.
• • •
BERYLLIUM RESEARCH AND DEVELOPMENT PROGRAM. VOLUME VI. INFLUENCE OF THE DISTRIBUTION OF OXIDE AND THE TOTAL IMPURITY LEVEL ON RECRYSTALLIZATION AND GRAIN GROWTH OF BERYLLIUM.
AD-613 952 DIV. 17

•MORISHIMA, MICHIO
• • •
THEORY OF GROWTH: REMODELLING AND REFINEMENTS,
AD-614 252 DIV. 32

•MORRIS, D. E.
• • •
EFFECT OF MAGNETIC FIELD ON THERMAL CONDUCTIVITY AND ENERGY GAP OF SUPERCONDUCTING FILMS,
AD-614 369 DIV. 25

•MORRISON, J. A.
• • •
HIGH-FIELD MAGNETORESISTANCE OF INHOMOGENEOUS SEMICONDUCTORS AND PLASMAS. III. TWO-DIMENSIONAL INHOMOGENEITY DISTRIBUTIONS
AD-614 163 DIV. 25
• • •
EXCESS THERMODYNAMIC FUNCTIONS FOR LIQUID MIXTURES OF METHANE+PROPANE,
AD-614 517 DIV. 4

•MORRISON, R. J.
• • •
DETERMINATION OF RECOILLESS FRACTIONS FROM MOSSBAUER SCATTERING,
AD-614 368 DIV. 20

•MORROW, WALTER E., JR.
• • •
LONG RANGE COMMUNICATION BY ORBITING DIPOLE BELTS,
AD-614 214 DIV. 5

•MORSE, JAMES H.
• • •
CONTINUOUSLY PULSED LASER DEVICE FOR SURVEILLANCE.
AD-614 445 DIV. 25

•MOW, C. C.
• • •
THE EFFECTS OF FLUID RESONANCE ON THE BOUNDARY STRESSES OF A FLUID-FILLED CAVITY,
AD-614 418 DIV. 13

•MUFSON, M. A.
• • •
PATTERNS OF ADENOVIRUS INFECTIONS IN MARINE CORPS PERSONNEL. I. A 42-MONTH SURVEY IN RECRUIT AND NON-RECRUIT POPULATIONS. II. LONGITUDINAL STUDY OF SUCCESSIVE ADVANCED RECRUIT TRAINING COMPANIES.
AD-614 306 DIV. 16

•MUIR, W. B.
• • •
ELECTRONIC STRUCTURE OF DILUTE SOLID SOLUTION ALLOYS OF 3D-TRANSITION METALS IN A NON-MAGNETIC MATRIX.
AD-614 482 DIV. 25

•MULLER, G.
• • •
APPLICATION OF VARIATIONAL METHODS FOR THE SOLUTION OF GASDYNAMIC AND MAGNETOGASDYNAMIC PROBLEMS.
AD-614 051 DIV. 25

•MUNDTH, ELDRED D.
• • •
IMPORTANCE OF PREVENTING RENAL VASCULAR COLLAPSE DURING PERIOD OF RENAL ISCHEMIA IN KIDNEY TRANSPLATATION,
AD-614 298 DIV. 16

•MUNOZ, D. R.
• • •
TRADEWIND DUCTING.
AD-614 240 DIV. 8

•MUNTZ, E. P.
• • •
AN EXPERIMENTAL STUDY OF LAMINAR NEAR WAKES,
AD-614 004 DIV. 9

•MURPHY, G. J.
• • •
A STABILITY CRITERION FOR PULSE-WIDTHMODULATED FEEDBACK CONTROL SYSTEMS.
AD-614 489 DIV. 30

•MYERS, BETTY-JUNE
• • •
THE LUNG WORM ANGIOSTRONGYLUS CANTONENSIS OF RODENTS ON TAIWAN (FORMOSA) AND THE OFF SHORE ISLANDS,
AD-614 300 DIV. 16

•MYERS, RALPH D.
• • •
FUNDAMENTAL PROBLEMS OF SOLIDS.
AD-614 136 DIV. 25

•MYSELS, KAROL J.

• • •
SOAP FILMS AND SOME PROBLEMS IN SURFACE AND COLLOID CHEMISTRY
AD-614 293 DIV. 4

•NAKORENKO, N. F.
• • •
CLIMATE OF THE FREE ATMOSPHERE,
AD-613 988 DIV. 2

•NAZZARO, JAMES RUSSELL
• • •
THE BISECTION OF A VISUAL EXTENT,
AD-614 338 DIV. 28

•NELSON, M. E.
• • •
COSMIC-RAY HEAVY NUCLEI AT THE GEOMAGNETIC EQUATOR
AD-614 549 DIV. 20

•NEWILL, VAUN A.
• • •
METHODOLOGY FOR TEST AND EVALUATION OF INFORMATION RETRIEVAL SYSTEMS,
AD-614 005 DIV. 32

•NEWSTEIN, MORRIS C.
• • •
FABRY-PEROT RESONANCES AT SMALL FRESNEL NUMBERS,
AD-614 063 DIV. 25

•NEWTON, R. R.
• • •
THE TRANSIT SYSTEM,
AD-614 162 DIV. 19

•NIKIFORUK, P. N.
• • •
ANALYSIS OF A LOADED HIGH-PRESSURE HYDRAULIC ON-OFF SERVOMECHANISM,
AD-614 529 DIV. 26

•NILSSON, OLLE
• • •
SOME FREQUENCY AND POWER CONVERSION PROPERTIES OF CYCLOTRON WAVES,
AD-614 123 DIV. 8

•NITTROUER, C. A.
• • •
DESIGN OF A HIGH-ENERGY FAST-PULSE POWER SYSTEM, PHASE II.
AD-613 959 DIV. 7

•NOREM, PHILIP
• • •
COLLISIONS OF THREE HARD SPHERES,
AD-614 294 DIV. 25

•NORTHRUP, MARGARET H.
• • •
ELECTROCHEMICAL STUDIES IN THE SYNTHESIS OF N-F COMPOUNDS.
AD-614 098 DIV. 4

•NORWOOD, J. M.
• • •
FORMULATION OF RADIATION TRANSPORT SOLUTIONS FOR SHIELDING APPLICATIONS, INCLUDING INTEGRAL TRANSFORM METHODS, MATRIX TECHNIQUES, AND ASYMPTOTIC APPROXIMATIONS.
AD-614 250 DIV. 20

•NUNES, JOHN
• • •
SLOW BEND-TENSION TEST CORRELATIONS OF SHORT BEAMS WITH SPECIAL REFERENCE TO THE CHARPY-TYPE SPECIMEN,
AD-614 095 DIV. 30

•NUTTER, P. B.
• • •
MICROWAVE NONLINEAR DIELECTRIC MATERIALS.
AD-614 274 DIV. 14

•OGG, RICHARD A. , JR.
• • •
PREPARATION AND PROTON MAGNETIC RESONANCE STUDIES OF ANHYDROUS AMMONIA,
AD-614 277 DIV. 25

•OLDERSHAW, G. A.
• • •
PHOTOCHEMICAL ADDITION OF HYDROGEN BROMIDE TO 2-BUTENE IN THE GAS PHASE,
AD-614 500 DIV. 4

•OLDFATHER, PAULA M.
• • •
PROGRAMMING BY QUESTIONNAIRE
AD-613 976 DIV. 30

•OLNESS, D.
• • •
PHOTOGENERATION OF FREE CARRIERS IN ORGANIC CRYSTALS VIA EXCITON-EXCITON INTERACTIONS
AD-614 389 DIV. 25

•OLSSON, RAY A.
• • •
METABOLIC RESPONSES DURING MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG
AD-614 346 DIV. 16
• • •
MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG
AD-614 347 DIV. 16

•OMORI, M.
• • •
STUDY OF PARALLEL PUMPING IN MICROWAVE FERRITES.
AD-614 049 DIV. 8

•ONEDA, S.
• • •
THE PHI-OMEGA MIXING ANGLE,
AD-614 171 DIV. 20
• • •
SU(3) SYMMETRY AND THE NONLEPTONIC K-MESON PROCESSES
AD-614 172 DIV. 20
• • •
UNITARY SYMMETRY AND NON-LEPTONIC K-DECAYS,
AD-614 173 DIV. 20

•ONEDA, SADAO
• • •
REMARKS ON STRANGENESS NON-CONSERVING WEAK LEPTONIC INTERACTIONS,
AD-614 174 DIV. 20

•ONG, J. N. , JR.
• • •
ESTIMATING METAL PARTICLE COMBUSTION KINETICS,
AD-614 563 DIV. 10

•OPPENHEIM, ALAN V.
• • •
SUPERPOSITION IN A CLASS OF NONLINEAR SYSTEMS.
AD-614 483 DIV. 15

•OSWALDO-CRUZ, E.
• • •
EVOKED ACTIVITY IN THE CAUDATE NUCLEUS OF THE CAT IN RESPONSE TO VARIOUS KINDS OF AFFERENT STIMULI. I. MACROPHYSIOLOGICAL STUDY (ACTIVITES EVOQUEES DANS LE NOYAU CAUDE DU CHAT EN REPONSE A DES TYPES DIVERS D'AFFERENCES. I. ETUDE MACROPHYSIOLOGIQUE,
AD-614 510 DIV. 16

•OVERMYER, ROBERT F.
• • •
SKIN FRICTION DRAG AND SHEAR STRESS DISTRIBUTION ON SEVERAL STREAMLINED BODIES OF REVOLUTION WITH VARIED FINENESS RATIO.
AD-614 237 DIV. 9

•OWINGS, D.
• • •
WAVELENGTH DEPENDENCE OF POLARIZATION. III. THE LUNAR SURFACE,
AD-614 170 DIV. 2

•OWSOWTIZ, SIDNEY
• • •
FACTORS AFFECTING CODING ERRORS,
AD-614 415 DIV. 8

•PAKISER, L. C.
• • •
THE BASALT-ECLOGITE TRANSFORMATION AND CRUSTAL STRUCTURE IN THE WESTERN UNITED STATES.
AD-614 303 DIV. 2

•PALADINO, A.
• • •
MICROWAVE NONLINEAR DIELECTRIC MATERIALS.
AD-614 274 DIV. 14

•PALLETT, D. S.
• • •
FLEXURAL-WAVE-TRANSMISSION PROPERTIES OF PLATE-JOINT AND ROD-JOINT SYSTEMS,
AD-614 264 DIV. 25

•PALLETT, M. E.
• • •
SATELLITE CONTROL FACILITY, DESIGN CRITERIA: DIRECT CONNECTION FOR CDC-160A COMPUTER TO TELETYPE TRANSMISSION LINES,
AD-614 002 DIV. 12

•PALMER, T. F.
• • •
FREE RADICALS BY MASS SPECTROMETRY. XXXII. THERMAL DECOMPOSITION OF CYCLOPENTYL RADICALS,
AD-614 509 DIV. 4

•PANIOM, MICHIYAN
• • •
A FIELD TRIAL OF A NEW TRANSPORT MEDIUM FOR COLLECTION OF FECES FOR BACTERIOLOGIC EXAMINATION,
AD-614 191 DIV. 16

•PAPAS, C. H.
• • •
ANTENNA RADIATION IN A MOVING DISPERSIVE MEDIUM
AD-614 275 DIV. 8

•PAPIRMEISTER, BRUNO
• • •
ELIMINATION OF SULFUR MUSTARD-INDUCED ALKYLATION PRODUCTS FROM DNA OF ESCHERICHIA COLI,
AD-614 267 DIV. 16
• • •
UNBALANCED GROWTH AND LATENT KILLING OF ESCHERICHIA COLI FOLLOWING EXPOSURE TO SULFUR MUSTARD.
AD-614 284 DIV. 16

•PAPP, C. A.
• • •
ESTIMATING METAL PARTICLE

COMBUSTION KINETICS,
AD-614 569 DIV. 10

•PARENT, ELIAS ALPHONSE , JR.
• • •
SEQUENTIAL RANKING PROCEDURES.
AD-614 271 DIV. 15

•PARKER, E. N.
• • •
DISCUSSION OF PAPER BY E. J. STEGELMANN AND C. H. VON KENSCHITZKI, 'ON THE INTERPRETATION OF THE SUDDEN COMMENCEMENT OF GEOMAGNETIC STORMS'
AD-614 168 DIV. 2

•PASSCHIER, A. A.
• • •
THERMODYNAMIC PROPERTIES OF AQUEOUS SOLUTIONS OF MIXED ELECTROLYTES. THE HYDROCHLORIC ACID-POTASSIUM CHLORIDE SYSTEM FROM 40 TO 0C,
AD-614 555 DIV. 4

•PATI, J. C.
• • •
THE PHI-OMEGA MIXING ANGLE,
AD-614 171 DIV. 20

•PATI, JOGESH C.
• • •
DYNAMICAL MODEL OF THE 1535-MEV XI0 HYPERON,
AD-614 176 DIV. 20

•PAUL, P.
• • •
RADIATIVE CAPTURE OF HE3 BY LI7,
AD-614 515 DIV. 20

•PEARSON, W. B.
• • •
CONSTITUTION AND MAGNETIC AND ELECTRICAL PROPERTIES OF PALLADIUM TELLURIDES (PDTE-PDTE2),
AD-614 519 DIV. 17

•PERRI, J. A.
• • •
POLYMORPHISM OF RARE EARTH DISILICIDES,
AD-614 137 DIV. 25

•PETERS, B. F.
• • •
AN ULTRASONIC METHOD FOR EVALUATING BONDS IN LARGE METALLIC BEARINGS,
AD-614 307 DIV. 26

•PETERS, EDWARD T.
• • •
ANALYTICAL STUDY OF THE THERMODYNAMIC FACTORS CONTROLLING DIAMOND SYNTHESIS AND GROWTH AT HIGH PRESSURES AND TEMPERATURES.
AD-614 082 DIV. 25

•PETERSON, ERNEST A.
• • •
FURTHER STUDIES OF HEARING IN THE GEKKONID LIZARDS,
AD-614 340 DIV. 16

•PETERSON, LYSLE H.
• • •
WATER AND ELECTROLYTE CONTENT OF NORMAL AND HYPERTENSIVE ARTERIES IN DOGS,
AD-614 561 DIV. 16

•PETRAUSKAS, A. A.
• • •
THERMAL DESORPTION OF SR FROM W,
AD-614 142 DIV. 25

•PETRONE, FRANCIS J.
• • •
ON EQUATIONS OF STATE IN SHOCK INITIATION PROBLEMS.
AD-613 989 DIV. 4

•PIATT, V. R.
• • •
THE PRESENT STATUS OF CHEMICAL RESEARCH IN ATMOSPHERE PURIFICATION AND CONTROL ON NUCLEAR-POWERED SUBMARINES.
AD-614 261 DIV. 31

•PICKFORD, L. M.
• • •
SMOOTH MUSCLE RESPONSES AS ALTERED BY HUMORAL BACKGROUND.
AD-614 478 DIV. 16

•PIERCE, J. A.
• • •
VERY LOW FREQUENCY PROPAGATION; ELECTRON AND SOLID STATE PHYSICS; AUTOMATIC CONTROL; COMMUNICATIONS AND NETWORKS; ELECTROMAGNETIC RADIATION.
AD-614 130 DIV. 30

•PIETSCH, L.
• • •
STUDY OF SPECIAL BEAMSHAPING ANTENNAS.
AD-613 932 DIV. 8

•PLAPINGER, ROBERT E.
• • •
REACTIONS OF ISOPROPYL METHYLPHOSPHONOFLUORIDATE WITH SUBSTITUTED PHENOLS. II,
AD-614 304 DIV. 4

•PLATE, ERICH J.
• • •
THE VELOCITY FIELD DOWNSTREAM FROM A TWODIMENSIONAL MODEL HILL. PART 1.
AD-614 067 DIV. 9

•PLUNKETT, T. F.
• • •
CAVITY NUCLEAR REACTORS
AD-613 998 DIV. 21

•POKROVSKII, A. A.
• • •
APPROXIMATE ENZYMIC METHOD OF MICROANALYSIS FOR IDENTIFYING RESIDUAL AMOUNTS OF ORGANO PHOSPHORUS INSECTICIDES,
AD-614 396 DIV. 4

•POKROVSKII, G. I.
• • •
CALCULATION OF CHARGES DURING MASSIVE EXPLOSIONS FOR THROWING-OUT, 2 ED. REV
AD-613 987 DIV. 13

•POLAK, J. A.
• • •
ANALYSIS OF NUCLEON TRANSFER DATA,
AD-614 089 DIV. 20

•POLK, C.
• • •
RESULTS OF SIMULTANEOUS ELF MEASUREMENTS AT BRANNENBURG GERMANY AND KINGSTON, R. I.
AD-614 012 DIV. 2

•POLLACK, IRWIN
• • •
IDENTIFICATION OF ELEMENTARY AUDITORY DISPLAYS: EFFECT OF UNBALANCED PROBABILITIES OF OCCURRENCE,
AD-614 297 DIV. 8

•PONOMAREVA, L. G.
• • •
APPROXIMATE ENZYMIC METHOD OF MICROANALYSIS FOR IDENTIFYING RESIDUAL AMOUNTS OF ORGANO PHOSPHORUS INSECTICIDES,
AD-614 396 DIV. 4

•POPOFF, A.
• • •
PHOTOELASTICITY: PRINCIPLES, METHODS AND APPLICATIONS TO MATERIALS TESTING, METALLURGY AND MECHANICS, PARTS I, II, III,
AD-614 282 DIV. 30

•POST, B.
• • •
POLYMORPHISM OF RARE EARTH DISILICIDES.
AD-614 137 DIV. 25

•POSTNIK, V. S.
• • •
STUDYING MECHANICAL AND THERMAL FATIGUE OF METALS BY THE INTERNAL FRICTION METHOD
AD-614 019 DIV. 17

•POULTON, D.
• • •
EFFECT OF PRESSURE ON THE HYDROLYSIS OF METHYL ACETATE AND ETHYLENE OXIDE IN ACETONE + WATER MIXTURES; QUANTITIES OF ACTIVATION AT CONSTANT VOLUME, AND THE ISOKINETIC PRESSURE,
AD-614 516 DIV. 4

•POWELL, ROBIN D.
• • •
RELATIONSHIP BETWEEN ACTIVITY OF PYRUVATE KINASE AND AGE OF THE NORMAL HUMAN ERYTHROCYTE,
AD-614 522 DIV. 16

•POZIOMEK, EDWARD J.
• • •
PHOTOCHEMICAL SYNTHESIS OF ANTIISONICOTINALDEHYDE OXIME.
AD-614 245 DIV. 16

•PRICE, E. W.
• • •
AN EXPERIMENTAL INVESTIGATION OF THE FLOW PHENOMENA INVOLVED IN GASEOUS THRUST DIRECTION CONTROL DEVICES.
AD-614 279 DIV. 27

•PRICE, WILLIAM E.
• • •
EVALUATION OF FIELD-EFFECT TRANSISTORS.
AD-614 268 DIV. 8

•PROKOSHKIN, D. A.
• • •
INVESTIGATING OXIDATIONS OF NIOBIUMTITANIUM-ZIRCONIUM ALLOYS,
AD-614 017 DIV. 17

•PROSSNER, T.
• • •
ANTENNA WIRE SAG AND TENSION CALCULATIONS,
AD-614 075 DIV. 8

•PUGH, JAMES E.
• • •
EVOKED RESPONSE LATENCY AS A FUNCTION OF STIMULUS RISE-TIME IN THE AUDITORY CORTEX,
AD-614 362 DIV. 16

•PULVARI, CHARLES F.
• • •

RESEARCH ON THE APPLICATION OF FERRO-AND FERRIELECTRIC PHENOMENA IN COMPUTER DEVICES.
AD-619 010 DIV. 20

•PURDY, WILLIAM C.
• • •
COULOMETRIC DETERMINATION OF PROTEIN NITROGEN,
AD-619 341 DIV. 16
• • •
USE OF HIGHLY ACID SUPPORTING ELECTROLYTES IN POLAROGRAPHY. OBSERVED CHANGES IN POLAR OGRAPHIC WAVES OF SELENIUM (IV) UPON STANDING,
AD-619 382 DIV. 4

•PYLE, JOHN B.
• • •
COMPARISON OF TWO VHF COMMUNICATION FREQUENCY ASSIGNMENT METHODS,
AD-619 443 DIV. 19

•QUIGLEY, FRANCIS C.
• • •
HOMOGENIZATION OF HIGH-STRENGTH STEEL AT 2500 F,
AD-619 277 DIV. 26

•QUINE, JOHN P.
• • •
ULTRA HIGH POWER TRANSMISSION LINE TECHNIQUES.
AD-613 953 DIV. 8

•QUINN, JOHN J.
• • •
DETERMINATION OF ELECTRON RELAXATION TIME FROM THE GIANT QUANTUM OSCILLATIONS IN THE ACOUSTIC ABSORPTION OF METALS
AD-619 527 DIV. 25

•RAIZER, YU. P.
• • •
ON THE PROPAGATION OF A SHOCK WAVE IN THE GROUND DURING IMPACT OF A VERY FAST METEORITE AGAINST THE SURFACE OF THE PLANET,
AD-619 018 DIV. 2

•RAMAN, R.
• • •
PHOTOCONDUCTIVITY OF ANTHRACENE,
AD-619 197 DIV. 25

•RAMDAS, A. K.
• • •
EFFECT OF UNIAXIAL STRESS ON THE EXCITATION SPECTRA OF DONORS IN SILICON,
AD-619 529 DIV. 25

•RAMMEIER, RENE O.
• • •
AGE HARDENING OF SNOW AT THE SOUTH POLE,
AD-619 430 DIV. 13

•RAPPAPORT, PAUL J.
• • •
THE EFFECT OF CARBONATED ELECTROLYTE ON THE PERFORMANCE OF SINTERED PLATE NICKEL-CADMIUM CELLS,
AD-619 104 DIV. 7

•RATLIFF, J. L.
• • •
ELECTROCHEMICAL BEHAVIOR OF TIOX SOLID SOLUTIONS IN AQUEOUS HF AND HF-HCL MIXTURES.
AD-619 183 DIV. 4

•RAY, JAMES D.
• • •
PREPARATION AND PROTON MAGNETIC RESONANCE STUDIES OF ANHYDROUS AMMONIA,
AD-619 377 DIV. 25

•RAYMUND, M.
• • •
A DETERMINATION OF THE SPIN OF LITHIUM 8 HYPERNUCLEUS
AD-619 187 DIV. 20

•REDIKER, R. H.
• • •
ELECTRICAL AND ELECTRO-OPTICAL PROPERTIES OF INTERFACE-ALLOY HETEROJUNCTIONS,
AD-619 320 DIV. 25

•RESLER, E. L. , JR.
• • •
VIBRATIONAL EXCITATION IN SOME FOUR-CENTER TRANSITION STATES,
AD-619 548 DIV. 4

•REUCROFT, P. J.
• • •
DIFFUSION IN ORGANIC CRYSTALS. I. SELFDIFFUSION IN ANTHRACENE,
AD-619 531 DIV. 25

•REYNOLDS, GEORGE O.
• • •
RELATIVE ADVANTAGES OF INTERFEROMETER OVER TELESCOPE FOR MEASURING SOURCE SIZES.
AD-619 248 DIV. 30

•REYNOLDS, JAMES H.
• • •
PROGRAMMING METHOD AND RESPONSE MODE IN A VISUAL ORAL TASK.
AD-619 014 DIV. 28

•RICE, STUART A.
• • •
GUEST-HOST INTERACTIONS: AN EXAMINATION OF THE SOLVENT-INDUCED SPECTRAL SHIFT IN A MODEL SYSTEM,
AD-619 289 DIV. 25

•RICHARDS, PAUL B.
• • •
SOME PERIODIC SOLUTIONS OF A FOUR-BODY PROBLEM,
AD-619 295 DIV. 2

•RICHMAN, MARC H.
• • •
THE ROLE OF CARBON AND FINE STRUCTURE IN THE HARDENING OF IRON-NICKEL-CARBON MARTENSITES
AD-619 447 DIV. 17

•RIEU, EMILE H.
• • •
INTEGRATION AND EVALUATION OF THE PHASE I NAVIGATIONAL CAPABILITY FOR PROGRAM 665A, UTILIZING THE AN/ASN-24V(MOD) DIGITAL COMPUTER,
AD-613 941 DIV. 19

•RINGROSE, JOHN R.
• • •
DERIVATIONS OF OPERATOR GROUP ALGEBRAS,
AD-613 927 DIV. 15

•RIVES, JOHN E.
• • •
DENSITY OF LIQUID HELIUM-3 BETWEEN 0.04S AND 1.3K,
AD-619 376 DIV. 4

•ROBELL, ANDREW J.
• • •
BASIC STUDY OF GAS-SOLID INTERACTIONS: I. INTERACTION OF HYDROGEN WITH PLATINIZED CARBON.
AD-619 041 DIV. 4

•ROBERG, D. JANE
• • •
THE GENERALIZATION OF HAMILTON'S MECHANICS. I. THEORY OF HOMOGENEOUS CONTACT TRANSFORMATIONS,
AD-619 029 DIV. 25

•ROBERTS, J. H.
• • •
CO-CATELYSES IN FRIEDEL-CRAFTS REACTIONS. PART VII. THE FORMATION OF ULTRAVIOLET CHROMOPHORES,
AD-619 509 DIV. 4

•ROBERTS, RICHARD A.
• • •
THEORY OF SIGNAL DETECTAB ILITY: COMPOSITE DEFERRED DECISION THEORY.
AD-619 480 DIV. 8

•ROBINSON, A. R.
• • •
FIRST TEST ON RADIATION EXPERIMENTATION FOR THE Q-FACTOR TECHNIQUE.
AD-619 112 DIV. 8

•ROBINSON, DONALD C.
• • •
STRUCTURAL AND MACHINERY VIBRATIONS OF HYDROFOIL SHIPS
AD-619 028 DIV. 31

•ROCHA-MIRANDA, C.
• • •
EVOKED ACTIVITY IN THE CAUDATE NUCLEUS OF THE CAT IN RESPONSE TO VARIOUS KINDS OF AFFERENT STIMULI. I. MACROPHYSIOLOGICAL STUDY (ACTIVITES EVOQUEES DANS LE NOYAU CAUDE DU CHAT EN REPONSE A DES TYPES DIVERS D'AFFERENCES. I. ETUDE MACROPHYSIOLOGIQUE,
AD-619 510 DIV. 16

•ROCKETT, B. W.
• • •
RING METALATION OF DIMETH YLAMINOMETHYLFERROCENE WITH BUTYLLITHIUM AND CONDENSATIONS WITH ELECTROPHILIC COMPOUNDS. SYNTHESIS OF 1,2-DISUBSTITUTED FERROCENES,
AD-619 544 DIV. 4

•ROGERS, D. B.
• • •
MAGNETIC PROPERTIES OF V(3+) IONS IN CUBIC SPINELS
AD-619 319 DIV. 25

•ROGERS, ELMER B.
• • •
MEASUREMENT OF ELECTROSTATIC CHARGE ON AIRCRAFT,
AD-619 060 DIV. 1

•ROMAIN, L. F.
• • •
SOME STUDIES ON THE SPECI FICITY OF AMINO ACID ENTRY ROUTES IN PIGEON ERYTHROCYTES
AD-619 319 DIV. 16

•ROMANOVSKII, G. V.
• • •
THE PHOTOGRAMMETRIC PARAMETERS OF THE CAMERA OF A PHOTOGRAPHIC APPARATUS,
AD-619 105 DIV. 2

•ROMIG, MARY F.
• • •
THE SCIENTIFIC STUDY OF METEORS IN THE 19TH CENTURY
AD-619 411 DIV. 2

•ROSA, C. J.
• • •
THE PARABOLIC OXIDATION KINETICS OF BETAZIRCONIUM.
AD-614 556 DIV. 17

•ROSE, R. M.
• • •
INFLUENCE OF CONTROLLED ADDITIONS OF OXYGEN ON THE SUPERCONDUCTIVITY OF NIOBIUM
AD-614 296 DIV. 25

•ROSEN, S. P.
• • •
UNITARY SYMMETRY AND WEAK INTERACTIONS. II. SU(3) TRANSFORMATION PROPERTIES
AD-614 154 DIV. 20

•ROSENBLATT, DAVID M.
• • •
REACTIONS OF ISOPROPYL METHYLPHOSPHONOFLUORIDATE WITH SUBSTITUTED PHENOLS. II.
AD-614 304 DIV. 4

•ROSENBLATT, MURRAY
• • •
TRANSITION PROBABILITY OPERATORS.
AD-614 426 DIV. 15

•ROSSER, W. A.
• • •
THERMAL DIFFUSIVITY OF AMMONIUM PERCHLORATE,
AD-614 081 DIV. 25

•ROSSI, B. B.
• • •
ISOTROPY OF COSMIC RADIATION
AD-614 381 DIV. 2

•ROSSI, JOSEPH J.
• • •
RESEARCH OF AERODYNAMIC METHODS OF PRODUCING ANTENNA WINDOWS IN A PLASMA SHEATH.
AD-614 084 DIV. 8

•ROWE, J. E.
• • •
VELOCITY TAPERING IN MICROWAVE AMPLIFIERS.
AD-614 244 DIV. 8

•ROYSE, CHESTER F. , JR.
• • •
SEDIMENTS OF WILLAPA SUBMARINE CANYON.
AD-614 454 DIV. 2

•ROYSTON, R. J.
• • •
THE RESOLUTION FUNCTION OF A TWO-ROTOR NEUTRON VELOCITY SELECTOR,
AD-614 221 DIV. 20

•RUBINOFF, MORRIS
• • •
THE EVALUATION OF TECHNIQUES AND DEVICES AS APPLIED TO PROBLEM SOLVING.
AD-614 228 DIV. 30

•RUDEE, MERVYN L.
• • •
GRAIN BOUNDARY SEGREGATION AND THE COLD WORK PEAK IN IRON CONTAINING CARBON OR NITROGEN.
AD-613 970 DIV. 17

•RUDERMAN, WARREN
• • •
DEVELOPMENT OF A CARBON DIOXIDE PARTIAL PRESSURE SENSOR.
AD-614 226 DIV. 16

•RUEI, K. H.
• • •
NATURE OF THE RESONANCE IN THE STATIC PION-NUCLEON SCATTERING IN ONE-MESON APPROX IMATION.
AD-613 934 DIV. 20

•RUSHFORTH, C. K.
• • •
RESTORATION OF OPTICAL PATTERNS,
AD-614 272 DIV. 30

•RUSS, SUDIE B.
• • •
THE NATURE OF ANTIBODIES FOLLOWING EXPERIMENTAL ARBOVIRUS INFECTION IN GUINEA PIGS,
AD-614 348 DIV. 16

•RUSSELL, LAWRENCE M.
• • •
SOME PERIODIC SOLUTIONS OF A FOUR-BODY PROBLEM,
AD-614 295 DIV. 2

•RYABYSHEV, A. M.
• • •
INVESTIGATING OXIDATIONS OF NIOBIUMTITANIUM-ZIRCONIUM ALLOYS,
AD-614 017 DIV. 17

•RYAN, JOHN J.
• • •
ANALYTICAL STUDY OF THE THERMODYNAMIC FACTORS CONTROLLING DIAMOND SYNTHESIS AND GROWTH AT HIGH PRESSURES AND TEMPERATURES.
AD-614 082 DIV. 25

•SACKTOR, BERTRAM
• • •
DPN-LINKED CYTOPLASMIC METABOLITES IN THE RAT-LEG MUSCLE, IN SITU, DURING CONTRACTION AND RECOVERY.
AD-614 246 DIV. 16

•SAIA, ANTHONY
• • •
SILICON AND ZINC EFFECT ON MAGNESIUM-LITHIUM AND MAGNESIUM-LITHIUM-SILVER ALLOYS.
AD-614 422 DIV. 17

•SALIVE, MARCEL L.
• • •
MATERIALS SURVEY FOR THE RESCUE AND SEARCH VEHICLES OF THE DEEP-SUBMERGENCE SYSTEMS PROJECT,
AD-614 421 DIV. 31

•SAMARA, G. A.
• • •
CURIE POINT MEASUREMENT AT HIGH PRESSURE BY A SINGLE COIL TECHNIQUE,
AD-614 322 DIV. 30

•SANDERS, T. M. , JR.
• • •
EXPERIMENTS ON DYNAMIC POLARIZATION OF PROTONS IN POLYETHYLENE BY THE 'SOLID EFFECT', A PROPOSED POLARIZED PROTON TARGET,
AD-614 145 DIV. 20

•SANDRI, GUIDO
• • •
COLLISIONS OF THREE HARD SPHERES,
AD-614 294 DIV. 25

•SARIO, LEO
• • •
HARMONIC FUNCTIONS WITH GIVEN VALUES AND MINIMUM NORMS IN RIEMANNIAN SPACES,
AD-614 543 DIV. 15

•SARNDAL, CARL-ERIK
• • •
A THEOREM ON RANK ORDERS FOR TWO CENSORED SAMPLES,
AD-614 301 DIV. 15

•SAULNIER, A.
• • •
BERYLLIUM RESEARCH AND DEVELOPMENT PROGRAM. VOLUME VI. INFLUENCE OF THE DISTRIBUTION OF OXIDE AND THE TOTAL IMPURITY LEVEL ON RECRYSTALLIZATION AND GRAIN GROWTH OF BERYLLIUM.
AD-613 952 DIV. 17

•SCARLETT, R. M.
• • •
NEW CONCEPTS FOR SOLID STATE MICROWAVE GENERATORS.
AD-614 000 DIV. 8

•SCARSI, L.
• • •
ISOTROPY OF COSMIC RADIATION
AD-614 381 DIV. 2

•SCHAEFER, HERMANN J.
• • •
A NOTE ON THE INFLUENCE OF SHIELD GEOMETRY ON AIR DOSE AND TISSUE DOSE FROM PROTONS WITHIN A SPACE VEHICLE
AD-613 993 DIV. 20

•SCHICK, GEORGE B.
• • •
DEVELOPMENT AND TESTING OF TAUT-NYLON MOORED INSTRUMENT STATIONS (WITH DETAILS OF DESIGN AND CONSTRUCTION),
AD-614 427 DIV. 2

•SCHOELER, H.
• • •
CALIBRATION OF SURVEY CAMERAS ON THE BASIS OF MODEL DEFORMATIONS,
AD-614 399 DIV. 2

•SCHRADER, DAVID M.
• • •
CALCULATION OF SPIN-SPIN INTERACTION INTEGRALS
AD-614 379 DIV. 25

•SCHRIEFFER, J. R.
• • •
CALCULATION OF THE QUASIP ARTICLE RECOMBINATION TIME IN A SUPERCONDUCTOR,
AD-614 367 DIV. 25

•SCHROEDER, MARK J.
• • •
PROBABILITY OF EFFECTIVE POST-ATTACK FIRE FIGHTING IN WILDLANDS,
AD-614 488 DIV. 13

•SCHUMAN, ELIAS V.
• • •
PROGRAM FOR THE STABILITY ANALYSIS OF A TOWED BODY.
AD-614 102 DIV. 30

•SCHWABE, K.
• • •
CURRENT FROM ALCOHOL
AD-614 388 DIV. 7

•SCHWARTZ, LORRAINE
• • •
CONSISTENT ESTIMATES AND ZERO-ONE SETS.
AD-613 917 DIV. 15

•SCHWARTZLOSE, RICHARD A.
• • •

DEVELOPMENT AND TESTING OF TAUT-NYLON MOORED INSTRUMENT STATIONS (WITH DETAILS OF DESIGN AND CONSTRUCTION), AD-614 427 DIV. 2

•SCHWIDERSKI, ERNST W.
• • •
SOME RECENT DEVELOPMENTS IN THE THEORY OF VISCOUS FLUID FLOW WITH TECHNOLOGICAL AND GEOPHYSICAL APPLICATIONS, AD-614 429 DIV. 9

•SCOTT, PAUL B.
• • •
MOLECULAR BEAM VELOCITY DISTRIBUTION MEASUREMENTS AD-614 220 DIV. 9

•SEFLEY, LEONARD C.
• • •
RESTANDARDIZATION OF THE ARMED FORCES WOMEN'S SELECTION TEST, AFWST 5 AND 6, AD-614 400 DIV. 23

•SEIDEL, HANS H.
• • •
TRANSIENT CHAMBER PRESSURE AND THRUST IN SOLID ROCKET MOTORS, AD-613 962 DIV. 27

•SELLERS, DAVID J.
• • •
A STUDY OF THE EFFECT OF HEAT TREATMENT ON THE MICRO STRUCTURE AND PROPERTIES OF SPRAYED MOLYBDENUM, AD-614 127 DIV. 26

•SELTZER, M. S.
• • •
DIFFUSION OF SULFUR 35 IN SINGLE CRYSTALS OF LEAD SULFIDE AS A FUNCTION OF STOIC HIOMETRY AND DOPING ADDITIONS AD-614 550 DIV. 25

•SESSIONS, MEREDITH H.
• • •
DEVELOPMENT AND TESTING OF TAUT-NYLON MOORED INSTRUMENT STATIONS (WITH DETAILS OF DESIGN AND CONSTRUCTION), AD-614 427 DIV. 2

•SETTI, R. LEVI
• • •
A DETERMINATION OF THE SPIN OF LITHIUM 8 HYPERNUCLEUS AD-614 187 DIV. 20
• • •
SOME POSSIBILITIES FOR UNUSUAL LIGHT HYPERNUCLEI AD-614 539 DIV. 20

•SHANABARGER, M. R.
• • •
EVIDENCE OF UNPINNED SURFACE SPINS FROM PARALLEL SPIN-WAVE RESONANCES IN PERMALLOY FILMS, AD-614 359 DIV. 25

•SHANNON, IRA L.
• • •
PAROTID FLUID FLOW RATE, PAROTID FLUID, AND SERUM INORGANIC PHOSPHATE CONCENTRATIONS AS RELATED TO DENTAL CARIES STATUS IN MAN, AD-614 334 DIV. 16

•SHAPIRO, I. I.
• • •
EFFECTS OF GENERAL RELATIVITY ON INTERPLANETARY TIME-DELAY MEASUREMENTS, AD-614 232 DIV. 25

•SHAURO, V. V.
• • •
HIGH-SPEED COLOR PHOTOGRAPHY OF SELFLUMINOUS PROCESSES AD-614 398 DIV. 24

•SHCHANIN, P. M.
• • •
SIMULATION OF PARTICLE MOTION IN INTERSECTING ELECTRIC AND MAGNETIC FIELDS, AD-613 980 DIV. 25

•SHCHEKIN, A. E.
• • •
CALIBRATION OF RADIOSONDES AT TEMPERATURES TO MINUS 100 DEGREES C, AD-613 979 DIV. 2

•SHILLAN, DAVID
• • •
SEMANTIC BASIS OF COMMUNI CATION. AD-614 093 DIV. 32

•SHIRYAEV, A. N.
• • •
ON THE THEORY OF RANDOM FUNCTIONS AND THE CONTROL OF PROCESSES ON THE BASIS OF INCOMPLETE DATA, AD-613 974 DIV. 15

•SHOEMAKER, CLARA B.
• • •
NEUTRON DIFFRACTION STUDIES OF THE ORDER OF THE ATOMS IN THE P PHASE AND THE R PHASE AD-614 149 DIV. 25

•SHOEMAKER, DAVID P.
• • •
NEUTRON DIFFRACTION STUDIES OF THE ORDER OF THE ATOMS IN THE P PHASE AND THE R PHASE AD-614 149 DIV. 25

•SIEKMANN, J.
• • •
THEORETICAL STUDIES OF SEA ANIMAL LOCOMOTION. PART I, AD-614 140 DIV. 9

•SIEKMANN, JULIUS
• • •
CONCERNING AN INTEGRAL OCCURRING IN AEROFOIL THEORY AD-614 139 DIV. 9

•SILLS, ARTHUR D.
• • •
PROPERTIES OF STRIP TRANS MISSION LINE, VOLUME I, AD-614 035 DIV. 8
• • •
PROPERTIES OF STRIP TRANS MISSION LINE, VOLUME II, AD-614 036 DIV. 8

•SILVER, M.
• • •
PHOTOGENERATION OF FREE CARRIERS IN ORGANIC CRYSTALS VIA EXCITON-EXCITON INTERACTIONS AD-614 385 DIV. 25

•SILVERMAN, HERBERT M.
• • •
IONOSPHERIC AND TROPOSPHERIC SCINTILLATIONS OF A RADIO STAR AT ZERO TO FIVE DEGREES OF ELEVATION. AD-614 161 DIV. 2

•SILVERS, LEWIS D., JR.
• • •
MECHANICAL ZERO G DEVICE AD-613 937 DIV. 22

•SILVERSTEIN, ARTHUR
• • •
SPECIFICITY OF GUINEA-PIG ANTIBODIES AND DELAYED HYPERSENSITIVITY, AD-614 179 DIV. 16

•SIME, COLBEN K., JR.
• • •
SKIN FRICTION DRAG AND SHEAR STRESS DISTRIBUTION ON SEVERAL STREAMLINED BODIES OF REVOLUTION WITH VARIED FINENESS RATIO. AD-614 237 DIV. 9

•SITNIKOVA, T. A.
• • •
NEW 5KHGSVF FORGING STEEL AD-614 390 DIV. 17

•SKJEGGESTAD, O.
• • •
ABSORPTION OF SIGMA(-) HYPERONS IN PHOTOGRAPHIC EMULSION NUCLEI, AD-614 213 DIV. 20

•SLABAUGH, L. V.
• • •
A SHIPBOARD CABLE-HAULING SYSTEM FOR LARGE ELECTRICAL CABLES, AD-614 071 DIV. 31

•SLACHMUYLDERS, ERIK
• • •
END-WALL HEAT-TRANSFER EFFECTS ON THE TRAJECTORY OF A REFLECTED SHOCK WAVE AD-614 378 DIV. 25

•SLATES, R. O.
• • •
AN EXPERIMENTAL INVESTIGATION OF THE FLOW PHENOMENA INVOLVED IN GASEOUS THRUST DIRECTION CONTROL DEVICES. AD-614 279 DIV. 27

•SLOCUM, D. W.
• • •
RING METALATION OF DIMETH YLAMINOMETHYLFERROCENE WITH BUTYLLITHIUM AND CONDENSATIONS WITH ELECTROPHILIC COMPOUNDS. SYNTHESIS OF 1,2-DISUBSTITUTED FERROCENES, AD-614 544 DIV. 4

•SMALL, S.
• • •
EXPERIMENTS ON THE LIFT AND DRAG OF SPHERES SUSPENDED IN A LOW REYNOLDS NO. POISEUILLE FLOW, AD-613 939 DIV. 9

•SMELTZER, W. W.
• • •
THE PARABOLIC OXIDATION KINETICS OF BETAZIRCONIUM. AD-614 556 DIV. 17

•SMIRNOV, V. I.
• • •
SETTLING-OUT OF COBALT FROM LEAN SOLUTIONS WITH SODIUM SULFIDE, AD-614 403 DIV. 17

•SMIT, J.
• • •
A THIN-PLATE BATTERY. SUPPLEMENT TO THINFILM MONOTRONICS. AD-614 471 DIV. 7

•SMITH, GRANT GILL
• • •
PYROLYSIS STUDIES. XII. STERIC INHIBITION OF RESONANCE IN THE VAPOR PHASE, AD-613 921 DIV. 4

•SMITH, J. L.
• • •
COMPLEX POISSON'S RATIO AND DILATATION CONSTANTS FROM FORCED VIBRATION OF A SPHERE
AD-614 461 DIV. 25

•SMITH, ROBERT E.
• • •
PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON COLD ACCLIMATION HELD AT INSTITUTO ANTARTICO ARGENTINO, BUENOS AIRES, AUGUST 5-7, 1959.
AD-614 146 DIV. 16

•SMITH, WARREN K.
• • •
A NEW METHOD FOR RAPID MEASUREMENT OF THERMAL DIFFUSIVITY AT ELEVATED TEMPERATURES WITH AN APPLICATION TO A SANDWICH STRUCTURE,
AD-614 034 DIV. 30

•SMULLIN, L. D.
• • •
GENERATION OF A HOT, DENSE PLASMA BY A COLLECTIVE BEAM-PLASMA INTERACTION,
AD-614 384 DIV. 25

•SOFFLEY, E. J.
• • •
AN EXPERIMENTAL STUDY OF LAMINAR NEAR WAKES,
AD-614 004 DIV. 9

•SOICHER, H.
• • •
DOWNWARD ELECTRON FLUX AT 1,000 KM ALTITUDE FROM ELECTRON CONTENT MEASUREMENT AT MID-LATITUDES,
AD-614 203 DIV. 2

•SOLIDAY, STANLEY M.
• • •
EFFECTS OF TASK LOADING ON PILOT PERFORMANCE DURING SIMULATED LOW-ALTITUDE HIGH SPEED FLIGHT,
AD-614 243 DIV. 28

•SOLIMENE, NICHOLAS
• • •
THEORY OF COHERENCE FOR THE QUANTIZED ELECTROMAGNETIC FIELD,
AD-614 062 DIV. 25

•SOLOMON, DAVID H.
• • •
INFLUENCE OF THE GASTROINTESTINAL IODIDE CYCLE ON THE EARLY DISTRIBUTION OF RADIOACTIVE IODIDE IN MAN,
AD-614 185 DIV. 16

•SPEARS, LARRY G.
• • •
ELECTROCHEMICAL STUDIES IN THE SYNTHESIS OF N-F COMPOUNDS.
AD-614 098 DIV. 4

•SPRADLIN, B. C.
• • •
RELIABILITY OF INTEGRATED CIRCUITS USED IN MISSILE SYSTEMS
AD-614 103 DIV. 8

•STANMEYER, WILLIAM
• • •
DENTAL OBSERVATIONS MADE WHILE WINTERING IN ANTARCTICA IN 1956-1957.
AD-614 318 DIV. 16

•STAROKOL'TSEV, V. I.
• • •
ULTRASONIC FLAW DETECTOR
AD-614 397 DIV. 30

•STAVE, ALLAN M.
• • •
THE QUANTIFICATION OF HUMAN RELIABILITY. A FEASIBILITY DEMONSTRATION.
AD-614 134 DIV. 28

•STEINER, R. F.
• • •
REDUCTION AND RE-OXIDATION OF THE DISULPHIDE BONDS OF SOY BEAN TRYPSIN INHIBITOR
AD-614 193 DIV. 16

•STEKOL'SHCHIKOV, E. V.
• • •
SPEED OF SOUND IN TWO-PHASE MEDIA,
AD-614 018 DIV. 25

•STEPHANI, RALPH A.
• • •
REACTIONS OF ISOPROPYL METHYLPHOSPHONOFLUORIDATE WITH SUBSTITUTED PHENOLS. II,
AD-614 304 DIV. 4

•STEPHENSON, JOHN M.
• • •
A SURVEY OF PIPE CORROSION AT NAVAL ACTIVITIES.
AD-614 259 DIV. 13

•STERN, EDWARD A.
• • •
FARADAY EFFECT IN SOLIDS
AD-614 558 DIV. 25

•STERN, J. A.
• • •
PHYSIOLOGICAL CORRELATES OF MENTAL DISEASE,
AD-614 148 DIV. 16

•STERN, J. H.
• • •
THERMODYNAMIC PROPERTIES OF AQUEOUS SOLUTIONS OF MIXED ELECTROLYTES. THE HYDROCHLORIC ACID-POTASSIUM CHLORIDE SYSTEM FROM 40 TO 0C,
AD-614 555 DIV. 4

•STERN, ROBERT M.
• • •
ELECTROPHYSIOLOGICAL EFFECTS OF THE INTERACTION BETWEEN TASK DEMANDS AND SENSORY INPUT,
AD-614 532 DIV. 28

•STERNHEIM, MORTON M.
• • •
SCATTERING OF PIONS BY LIGHT NUCLEI,
AD-614 087 DIV. 20

•STEWART, DOROTHY G.
• • •
A GUIDE TO THE TYPING OF MATHEMATICAL NOTATION,
AD-613 942 DIV. 24

•STEWART, WILFORD S.
• • •
NONBENZENOID AROMATIC SYSTEMS. I. SYNTHESIS OF 1-VINYLAZULENE AND CERTAIN SUBSTITUTED 1-VINYLAZULENES
AD-614 491 DIV. 4

•STOKES, R. J.
• • •
MECHANICAL PROPERTIES OF POLYCRYSTALLINE SODIUM CHLORIDE,
AD-614 054 DIV. 25

•STOPEK, S.
• • •
ELECTRICAL AND ELECTRO-OPTICAL PROPERTIES OF INTERFACE-ALLOY HETEROJUNCTIONS,
AD-614 320 DIV. 25

•STOPP, P. E.
• • •
OPHTHALMOSCOPY OF PIGEONS USING TRANSILLUMINATION,
AD-614 194 DIV. 16

•STRANAHAN, G.
• • •
MESON EFFECTS IN N-P CAPTURE,
AD-614 151 DIV. 20

•STRAUMANIS, M. E.
• • •
ELECTROCHEMICAL BEHAVIOR OF TIOX SOLID SOLUTIONS IN AQUEOUS HF AND HF-HCL MIXTURES.
AD-614 183 DIV. 4

•STRAUSS, A. J.
• • •
PARTIAL PRESSURES AND GIBBS FREE ENERGY OF FORMATION FOR CONGRUENTLY SUBLIMING CDTE(C),
AD-614 292 DIV. 25

•STREYDIO, JEAN-MARIE
• • •
QUENCHING AND POST-IRRADIATION STUDIES ON CDS SINGLE CRYSTALS. TRANSPORT PROPERTIES OF BISMUTH ROLLED THIN FOILS.
AD-614 485 DIV. 25

•STROM, S. E.
• • •
COMPARISON BETWEEN MODEL ATMOSPHERES AND SPECTRA FROM EARLY-TYPE STARS,
AD-614 523 DIV. 2

•STURTEVANT, BRADFORD
• • •
END-WALL HEAT-TRANSFER EFFECTS ON THE TRAJECTORY OF A REFLECTED SHOCK WAVE
AD-614 378 DIV. 25

•SULLIVAN, ROGER D.
• • •
COLLISIONS OF THREE HARD SPHERES,
AD-614 294 DIV. 25

•SUN, HUEI-YING
• • •
GUEST-HOST INTERACTIONS: AN EXAMINATION OF THE SOLVENT-INDUCED SPECTRAL SHIFT IN A MODEL SYSTEM,
AD-614 289 DIV. 25

•SWALLOW, RONALD J.
• • •
COGNITRON THEORY,
AD-614 006 DIV. 30

•SWANSON, VIRGINIA L.
• • •
THE IMPORTANCE AND RELIABILITY OF THE ROENTGENOGRAPHIC EXAMINATION OF THE SMALL BOWEL IN PATIENTS WITH TROPICAL SPRUE,
AD-613 918 DIV. 16

•SWARTZ, HAROLD M.
• • •
ELECTRON SPIN RESONANCE CHARACTERISTICS OF SOME NORMAL TISSUES; EFFECT OF MICROWAVE POWER,
AD-614 343 DIV. 16

•SWEETLAND, ANDERS
• • •

FACTORS AFFECTING CODING ERRORS,
AD-614 415 DIV. 8

•SWICORD, M.
• • •
PHOTOGENERATION OF FREE CARRIERS IN ORGANIC CRYSTALS VIA EXCITON-EXCITON INTERACTIONS
AD-614 385 DIV. 25

•SYRE, R.
• • •
BERYLLIUM RESEARCH AND DEVELOPMENT PROGRAM. VOLUME VI. INFLUENCE OF THE DISTRIBUTION OF OXIDE AND THE TOTAL IMPURITY LEVEL ON RECRYSTALLIZATION AND GRAIN GROWTH OF BERYLLIUM.
AD-613 952 DIV. 17

•TANIGAKI, T.
• • •
ARYL BORON FREE RADICALS
AD-614 547 DIV. 4

•TASCHEK, WALTER G.
• • •
FUEL CELL ELECTRODES FOR ACID MEDIA,
AD-614 329 DIV. 7

•TAYLOR, J. B.
• • •
PHYSICAL PROPERTIES OF ALPHA AND GAMMA ARSENIC,
AD-614 506 DIV. 17

•TEDMON, C. S. , JR.
• • •
INFLUENCE OF CONTROLLED ADDITIONS OF OXYGEN ON THE SUPERCONDUCTIVITY OF NIOBIUM
AD-614 296 DIV. 25

•TERRY, DONALD F.
• • •
TYPOGRAPHICAL CUING IN CONVENTIONAL AND PROGRAMED TEXTS,
AD-614 317 DIV. 23

•THAYER, JOHN S.
• • •
LEWIS ACID ADDUCTS OF GROUP IV-A AZIDES,
AD-613 920 DIV. 4

•THOMAS, J. G.
• • •
ULTRASONIC WELDING PROCESS AND EQUIPMENT FOR CONSTRUCTION OF ELECTRON-TUBE MOUNTS.
AD-614 450 DIV. 26

•TIMOFEEV, N.
• • •
COSMIC HORIZONS OF ANABIOSIS
AD-614 394 DIV. 16

•TINKHAM, M.
• • •
EFFECT OF MAGNETIC FIELD ON THERMAL CONDUCTIVITY AND ENERGY GAP OF SUPERCONDUCTING FILMS,
AD-614 369 DIV. 25

•TOKAR, F. G.
• • •
CLIMATE OF THE FREE ATMOSPHERE,
AD-613 988 DIV. 2

•TOKHEIM, R. E.
• • •
SATURATION PHENOMENA IN ZN2Y FERRITE AT FREQUENCIES BELOW RESONANCE,
AD-614 235 DIV. 25

•TOMBOULIAN, D. F.
• • •
PHOTOIONIZATION CROSS SECTION OF HELIUM IN THE 100- TO 250-A REGION,
AD-614 523 DIV. 25

•TONGE, F. M.
• • •
SOME REFLECTIONS ON A SURVEY OF RESEARCH PROBLEMS IN COMPUTER SOFTWARE,
AD-614 417 DIV. 30

•TORCHIA, D.
• • •
ANALYSIS OF NUCLEON TRANSFER DATA,
AD-614 089 DIV. 20

•TOWERS, G. H. N.
• • •
PHENOLIC ACIDS AND LIGNINS IN THE LYCOPODIALES,
AD-614 513 DIV. 4

•TRAETTEBERG, M.
• • •
AUTO-AND CROSS-CORRELATION FUNCTIONS USED AS TOOLS FOR INFORMATION RETRIEVAL IN ELECTRON DIFFRACTION STRUCTURE STUDIES
AD-614 534 DIV. 25

•TRAVIS, D. N.
• • •
IDENTIFICATION OF FREE RADICALS IN FLASH PHOTOLYSIS
AD-614 497 DIV. 25

•TRIKHANOVA, N. V.
• • •
SIMULATION OF PARTICLE MOTION IN INTERSECTING ELECTRIC AND MAGNETIC FIELDS,
AD-613 980 DIV. 25

•TROFIMOV, K. N.
• • •
RADIO AND RADAR TECHNOLOGY AND ITS APPLICATION,
AD-613 964 DIV. 5

•TSAI, C. S.
• • •
A RIBOSOMAL PEPTIDASE FROM ESCHERICHIA COLI B,
AD-614 521 DIV. 16

•TUAN, S. F.
• • •
CONSIDERATIONS ON THE ISOBAR MECHANISM AND RESONANCE POLES FOR PION-BARYON SYSTEMS
AD-614 143 DIV. 20
• • •
POSSIBLE EXPERIMENTAL CONSEQUENCES OF TRIANGLE SINGU LARITIES IN STRANGE-PARTICLE PRODUCTION PROCESSES,
AD-614 144 DIV. 20
• • •
ENERGY PEAKS FOR THREE-BODY MESON SYSTEMS,
AD-614 150 DIV. 20
• • •
MESON-BARYON SYSTEMS AND THEIR RESONANCES,
AD-614 152 DIV. 20

•TUBIS, ARNOLD
• • •
CROSSING RELATIONS AND LEGENDRE EXPANSIONS IN PION-PION SCATTERING,
AD-614 153 DIV. 20

•TURNER, H. C.
• • •
PATTERNS OF ADENOVIRUS INFECTIONS IN MARINE CORPS PERSONNEL. I. A 42-MONTH SURVEY IN RECRUIT AND NON-RECRUIT POPULATIONS. II. LONGITUDINAL STUDY OF SUCCESSIVE ADVANCED RECRUIT TRAINING COMPANIES.
AD-614 306 DIV. 16

•UDIAS, AGUSTIN
• • •
A STUDY OF THE AFTERSHOCKS AND FOCAL MECHANISM OF THE SALINAS-WATSONVILLE EARTH QUAKES OF AUGUST 31 AND SEPTEMBER 14, 1963,
AD-614 335 DIV. 2

•UL HAQUE, SHAMIN
• • •
A FIELD TRIAL OF A NEW TRANSPORT MEDIUM FOR COLLECTION OF FECES FOR BACTERIOLOGIC EXAMINATION,
AD-614 191 DIV. 16

•ULLIAN, JOSEPH
• • •
PRESERVATION OF UNAMBIGUITY AND INHERENT AMBIGUITY IN CONTEXT FREE LANGUAGES.
AD-614 073 DIV. 30

•UNDERHILL, E. W.
• • •
BIOSYNTHESIS OF MUSTARD OIL GLUCOSIDES: V. FORMATION OF GLUCONASTURTIIN FROM L-GAMMAPHENYLBUTYRINE-C(14)-N(15) IN WATERCRESS,
AD-614 508 DIV. 16
• • •
BIOSYNTHESIS OF MUSTARD OIL GLUCOSIDES. VI. BIOSYNTHESIS OF GLUCOBARBARIN IN RESEDA LUTEOLA L,
AD-614 512 DIV. 16

•UNTEREGGER, P.
• • •
THE HISTORICAL DEVELOPMENT OF THE SPINOR THEORY IN THE RIEMANNIAN GEOMETRY (SURVEY ON THE PUBLISHED LITERATURE)
AD-614 049 DIV. 25

•UTTER, D. H.
• • •
A PILOT DISPLAY CONCEPT FOR NEAR-TARGET MANEUVERS DURING RENDEZVOUS,
AD-613 958 DIV. 12

•VALENTI, VENANZIO
• • •
NEW TRIPHENYLPHOSPHINE HYDRIDES OF RHENIUM (NUOVI IDRURI TRIFENILFOSFINICI DI RENIO),
AD-614 207 DIV. 4

•VAN HEYNINGEN, W. E.
• • •
THE ROLE OF GANGLIOSIDE IN THE MODE OF ACTION OF TETANUS TOXIN,
AD-614 202 DIV. 16

•VAN SANT, THOMAS A.
• • •
THE LEBESGUE-STIELJES INTEGRAL AS APPLIED IN PROBABILITY DISTRIBUTION THEORY,
AD-614 256 DIV. 19

•VAND, V.
• • •
RESEARCH, DEVELOPMENT AND APPLICATIONS OF X-RAC, S-FAC AND R-PAC, ELECTRONIC ANALOGUE COMPUTERS FOR X-RAY CRYSTAL ANALYSIS.
AD-613 925 DIV. 30

•VARANOV, V. B.

• • •
THE BOUNDARY LAYER ON A FLAT PLATE IN ANISOTROPIC MAGNETOHYDRODYNAMICS,
AD-619 391 DIV. 25

•VASIL'EV, L. A.
• • •
USE OF SHADOWGRAPH MEASUR EMENTS FOR QUALITATIVE RESEARCH OF A SUPERSONIC FLOW AROUND A WING PROFILE,
AD-619 389 DIV. 9

•VASIL'EVA, E. V.
• • •
INVESTIGATING OXIDATIONS OF NIOBIUMTITANIUM-ZIRCONIUM ALLOYS,
AD-619 017 DIV. 17

•VEISIG, G. S.
• • •
OBSERVATIONAL DATA FROM THE ANNULAR SOLAR ECLIPSE OF 31 JULY 1962,
AD-613 978 DIV. 2

•VENKATESAN, BHARATHI
• • •
GEOGRAPHIC CHARTS AND ALTITUDE PLOTS FOR SELECTED VALUES OF GEOMAGNETIC SHELL PARAMETERS B AND L,
AD-619 101 DIV. 2

•VERNON, JACK A.
• • •
FURTHER STUDIES OF HEARING IN THE GEKKONID LIZARDS,
AD-619 340 DIV. 16

•VERNOV, S. N.
• • •
INVESTIGATIONS OF RADIATIONS ON MAN-MADE EARTH SATELLITE COSMOS-17,
AD-619 402 DIV. 12

•VESTINE, E. H.
• • •
THE WORLD MAGNETIC SURVEY AND THE EARTH'S INTERIOR,
AD-619 409 DIV. 2

•VETLOV, I. P.
• • •
FORMULATION OF TRAJECTORIES OF AIR PARTICLES WITH THE AID OF ELECTRONIC COMPUTERS
AD-619 021 DIV. 2

•VICK, JAMES A.
• • •
USE OF ISOPROTERENOL AND PHENOXYBENZAMINE IN TREATMENT OF ENDOTOXIN SHOCK,
AD-619 266 DIV. 16

•VIDAVER, G. A.
• • •
SOME STUDIES ON THE SPECI FICITY OF AMINO ACID ENTRY ROUTES IN PIGEON ERYTHROCYTES
AD-619 314 DIV. 16

•VON RUDLOFF, E.
• • •
MINOR COMPONENTS OF THE OIL OF ARAUCARIA,
AD-619 524 DIV. 4

•WAGNER, J. B. , JR.
• • •
DIFFUSION OF SULFUR 35 IN SINGLE CRYSTALS OF LEAD SULFIDE AS A FUNCTION OF STOIC HIOMETRY AND DOPING ADDITIONS
AD-619 550 DIV. 25

•WALES, C. P.
• • •
OXIDES ON THE SILVER ELECTRODE. PART 2. X-RAY DIFFRACTION STUDIES OF THE WORKING SILVER ELECTRODE.
AD-619 098 DIV. 7

•WALI, K. C.
• • •
SCATTERING MATRIX APPROACH TO THE LAMBDA HYPERON-PION RESONANCE,
AD-619 374 DIV. 20

•WARD, MARTHA K.
• • •
STUDIES ON ANTHRAX INFECTIONS IN IMMUNIZED GUINEA PIGS,
AD-619 321 DIV. 16

•WATANABE, TADASHI
• • •
REACTION KINETICS, THE THEORY OF LIQUIDS, AND OPTICAL ROTATION.
AD-619 083 DIV. 4

•WATERS, W. E.
• • •
A THREE-WATT LOW-NOISE TRAVELING-WAVE TUBE FOR C-BAND.
AD-619 125 DIV. 8

•WATSON, RICHARD W.
• • •
STRESS WAVES IN BOUNDED MEDIA.
AD-613 939 DIV. 22

•WATT, WILLIAM C.
• • •
PLACEBO IV. RULES, CONCO RDANCE, SAMPLE COMPUTER GENERATION
AD-619 297 DIV. 30
• • •
A PREREQUISITE TO THE UTILITY OF MICROGRAMMARS,
AD-619 258 DIV. 30

•WAUGH, J. S.
• • •
MICROWAVE NONLINEAR DIELECTRIC MATERIALS.
AD-619 274 DIV. 14

•WAYNE, R. C.
• • •
ANOMALOUS NUCLEAR MAGNETIC RESONANCE LINEWIDTH IN LITHIUM
AD-619 365 DIV. 25
• • •
ESR MEASUREMENT OF SPIN SUSCEPTIBILITY OF GRAPHITE IN A LOW MAGNETIC FIELD,
AD-619 366 DIV. 20

•WEEKS, THOMAS M.
• • •
INTERACTION OF A STARTING VORTEX AS WELL AS A VORTEX STREET WITH A TRAVELING SHOCK WAVE.
AD-619 311 DIV. 9

•WEI, LING Y.
• • •
HOT-ELECTRON LOSS VIA WIGGLED AUGER RECOMBINATION IN SEMICONDUCTORS,
AD-619 358 DIV. 25

•WEIHRAUCH, P. F.
• • •
THE DIMENSIONAL STABILITY OF SELECTED ALLOY SYSTEMS.
AD-613 931 DIV. 17

•WEINBERGER, H. L.
• • •
EXTENT OF ANTIGENIC VARIATION OF A2 INFLUENZA VIRUSES FROM PROTOTYPE STRAINS,
AD-619 345 DIV. 16

•WEISS, HARVEY J.
• • •
THE EFFECT OF DEXTRAN ON PLATELET FACTOR 3 ACTIVITY IN VITRO AND IN VIVO STUDIES
AD-619 342 DIV. 16

•WELANDER, PIERRE
• • •
INERTIAL BOUNDARY CURRENT OF SIMILARITY TYPE IN HOMOGENEOUS AND STRATIFIED OCEANS.
AD-619 097 DIV. 2

•WELLING, H.
• • •
RESONANT FREQUENCY MIXING EFFECTS IN DISTRIBUTED MEDIA.
AD-619 208 DIV. 25

•WESSEL-BERG, TORE
• • •
HIGH POWER X-BAND GENERATOR.
AD-619 001 DIV. 8

•WEST, ROBERT
• • •
LEWIS ACID ADDUCTS OF GROUP IV-A AZIDES,
AD-613 920 DIV. 4
• • •
SYNTHESIS OF A SILAZAROPH ENANTHRENE,
AD-613 923 DIV. 4
• • •
A NOVEL REARRANGEMENT OF 1,2-BIS (TRIMETHYLSILYL)-HYDRAZINE,
AD-619 290 DIV. 4

•WESTERN, G. T.
• • •
THE INTERACTIONS OF 14.6-MEV NEUTRONS IN IRON, LITHIUM-7, AND CARBON.
AD-619 451 DIV. 20

•WESTHEIMER, GERALD
• • •
VISUAL ACUITY,
AD-619 178 DIV. 16

•WESTLUND, D. R.
• • •
ANALYSIS OF A LOADED HIGH-PRESSURE HYDRAULIC ON-OFF SERVOMECHANISM,
AD-619 535 DIV. 26

•WESTMANN, R. A.
• • •
SOLID ROCKET STRUCTURAL INTEGRITY ABSTRACTS. VOLUME II, NO. 2,
AD-619 484 DIV. 10

•WEVER, ERNEST GLEN
• • •
FURTHER STUDIES OF HEARING IN THE GEKKONID LIZARDS,
AD-619 340 DIV. 16

•WHALLEY, E.
• • •
EFFECT OF PRESSURE ON THE HYDROLYSIS OF METHYL ACETATE AND ETHYLENE OXIDE IN ACETONE + WATER MIXTURES: QUANTITIES OF ACTIVATION AT CONSTANT VOLUME, AND THE ISOKINETIC PRESSURE,
AD-619 516 DIV. 4

•WHITE, DANNY V.
• • •
PYROLYSIS STUDIES. XII. STERIC INHIBITION OF RESONANCE IN THE VAPOR PHASE,
AD-613 921 DIV. 4

•WHITE, J. F. , JR.
• • •
THE EVALUATION OF TECHNIQUES AND DEVICES AS APPLIED TO PROBLEM SOLVING.
AD-614 228 DIV. 30

•WHITE, JOHN I.
• • •
DPN-LINKED CYTOPLASMIC METABOLITES IN THE RAT-LEG MUSCLE, IN SITU, DURING CONTRACTION AND RECOVERY.
AD-614 246 DIV. 16

•WIGEN, P. E.
• • •
EVIDENCE OF UNPINNED SURFACE SPINS FROM PARALLEL SPIN-WAVE RESONANCES IN PERMALLOY FILMS,
AD-614 359 DIV. 25

•WIGGINS, RALPH A.
• • •
ON FACTORING THE CORRELATIONS OF DISCRETE MULTI-VARIABLE STOCHASTIC PROCESSES.
AD-614 040 DIV. 15

•WILCOX, G. E.
• • •
A SOLID STATE NUCLEAR DETECTOR.
AD-614 432 DIV. 20

•WILCZEK, A.
• • •
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-613 995 DIV. 8
• • •
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-614 059 DIV. 8

•WILKE, K. H.
• • •
THE ADIABATIC LINEAR STARK EFFECT IN A PLASMA,
AD-614 283 DIV. 25

•WILKS, YORICK
• • •
SEMANTIC BASIS OF COMMUNI CATION.
AD-614 093 DIV. 32

•WILLIAMS, CARL E.
• • •
ARTICULATION-TESTING METHODS: CONSONANTAL DIFFERENTIATION WITH A CLOSED-RESPONSE SET,
AD-614 336 DIV. 5

•WILLIAMS, D. L. H.
• • •
THE REARRANGEMENT OF AROMATIC N-NITROAMINES. PART III. THE ACID-CATALYSED REARRANGEMENT OF N-NITROANILINE,
AD-614 215 DIV. 4

•WILLIAMS, EDGAR W.
• • •
FLYING STRESS IN RELATION TO FLYING PROFICIENCY,
AD-614 332 DIV. 16

•WILLIAMS, J. R.
• • •
THE INTERACTIONS OF 14.6-MEV NEUTRONS IN IRON, LITHIUM-7, AND CARBON.
AD-614 451 DIV. 20

•WILLIS, JACK
• • •
SOME CHARACTERISTICS OF 25-CPS SHALLOW-WATER AMBIENT NOISE.
AD-614 546 DIV. 2

•WILLNER, ABNER R.
• • •
MATERIALS SURVEY FOR THE RESCUE AND SEARCH VEHICLES OF THE DEEP-SUBMERGENCE SYSTEMS PROJECT.
AD-614 421 DIV. 31

•WILSON, ROBERT B.
• • •
TWO NOTES ON ESTIMATING SHAPE PARAMETERS,
AD-614 419 DIV. 15

•WINEGARD, W. C.
• • •
THERMAL CONVECTION DURING HORIZONTAL SOLIDIFICATION OF PURE METALS AND ALLOYS.
AD-614 182 DIV. 17

•WIRTA, ROY W.
• • •
A CORRELATIONAL STUDY OF MYOPOTENTIAL RESPONSE AND FORCE OF MUSCLE CONTRACTION DURING VARYING ACTIVITY DEMANDS.
AD-613 930 DIV. 30

•WISE, H.
• • •
THERMAL DIFFUSIVITY OF AMMONIUM PERCHLORATE,
AD-614 081 DIV. 25

•WITHEY, R. J.
• • •
EFFECT OF PRESSURE ON THE HYDROLYSIS OF METHYL ACETATE AND ETHYLENE OXIDE IN ACETONE + WATER MIXTURES: QUANTITIES OF ACTIVATION AT CONSTANT VOLUME, AND THE ISOKINETIC PRESSURE,
AD-614 516 DIV. 4

•WOLBARSHT, M. L.
• • •
OPHTHALMOSCOPY OF PIGEONS USING TRANSILLUMINATION,
AD-614 194 DIV. 16

•WOLD, A.
• • •
MAGNETIC PROPERTIES OF V(3+) IONS IN CUBIC SPINELS
AD-614 319 DIV. 25

•WONG, HAROLD Y.
• • •
EVALUATION OF FIELD-EFFECT TRANSISTORS.
AD-614 268 DIV. 8

•WOODCOCK, RICHARD F.
• • •
NEODYMIUM LASER GLASS IMPROVEMENT PROGRAM.
AD-613 963 DIV. 25

•WOOLLEY, R. F.
• • •
PRODUCTION ENGINEERING MEASURE FOR TYPE CR-(XM-60)/U CRYSTAL UNITS.
AD-614 074 DIV. 8

•WOOSTER, HAROLD
• • •
CONVERSATION ON INDIAN LIBRARIES,
AD-614 190 DIV. 32

•WORKMAN, J. W.
• • •
THE EFFECTS OF FLUID RESONANCE ON THE BOUNDARY STRESSES OF A FLUID-FILLED CAVITY,
AD-614 418 DIV. 17

•WORMSER-SHAVIT, EVA
• • •
DPN-LINKED CYTOPLASMIC METABOLITES IN THE RAT-LEG MUSCLE, IN SITU, DURING CONTRACTION AND RECOVERY.
AD-614 246 DIV. 16

•WORSFOLD, D. J.
• • •
ANIONIC POLYMERIZATION OF BUTADIENE AND STYRENE.
AD-614 498 DIV. 4

•WRIGHT, G. B.
• • •
SIMPLE CONSTRUCTION FOR DETERMINING THE PHASE CHANGE OF LIGHT REFLECTED AT NORMAL INCIDENCE,
AD-614 309 DIV. 25

•WU, S. H.
• • •
A STABILITY CRITERION FOR PULSE-WIDTHMODULATED FEEDBACK CONTROL SYSTEMS.
AD-614 489 DIV. 30

•WUERTZ, GERHARD
• • •
COMMENTS ON THE EFFECT OF A DEFORMED, PLANE PARALLEL GLASS PLATE IN THE IMAGE PLANE OF AN OBJECTIVE ON ITS DISTORTION
AD-614 401 DIV. 2

•WULFF, J.
• • •
INFLUENCE OF CONTROLLED ADDITIONS OF OXYGEN ON THE SUPERCONDUCTIVITY OF NIOBIUM
AD-614 296 DIV. 25

•WYLLIE, JOHN COOK
• • •
SCIENCE-TECHNOLOGY SUBJECT-HEADING LISTS IN ENGLISH, RECENT OR STILL USEFUL IN PROGRAMMING INFORMATION RETRIEVAL SYSTEMS.
AD-614 438 DIV. 32

•YABLONSKII, YU. A.
• • •
SETTLING-OUT OF COBALT FROM LEAN SOLUTIONS WITH SODIUM SULFIDE,
AD-614 405 DIV. 17

•YAMAZAKI, HIDEO
• • •
COLLISIONAL DEACTIVATION OF THE EXCITED SINGLET OXYGEN ATOMS AND THEIR INSERTION INTO THE CH BONDS OF PROPANE
AD-614 502 DIV. 4

•YATES, G. KENNETH
• • •
SOLAR FLARE HIGH ENERGY ALPHA PARTICLES AND THEIR STORAGE IN INTERPLANETARY SPACE,
AD-614 217 DIV. 2

•YAU, S. S.
• • •
DISTANCE MATRIX OF A GRAPH AND ITS REALIZABILITY
AD-614 359 DIV. 15
• • •
THE SENSITIVITY OF A TRAFFIC NETWORK,
AD-614 560 DIV. 8

•YOSHIOKA, GARY A.
• • •
COASTAL STORMS OF THE

EASTERN UNITED STATES,
AD-619 189 DIV. 2

•YOUNG, ALLEN A.
• • •
THE EFFECT OF DEXTRAN
ON PLATELET FACTOR 3 ACTIVITY
IN VITRO AND IN VIVO STUDIES
AD-619 342 DIV. 16

•YOUNG, G. A.
• • •
A STUDY OF AEROMAGNETIC
DATA, NEW ENGLAND SEAMOUNT
AREA.
AD-619 117 DIV. 2

•YU, YI-YUAN
• • •
ON LINEAR EQUATIONS OF
ANISOTROPIC ELASTIC PLATES
AD-619 132 DIV. 25

•ZAJONC, TOBERT B.
• • •
GROUP SUCCESS AND THE
REDUCTION OF STATUS INCONGRUENCE
IN TASK-ORIENTED GROUPS,
AD-619 949 DIV. 28

•ZAMIR, DAVID
• • •
ANOMALOUS NUCLEAR MAGNETIC
RESONANCE LINEWIDTH IN LITHIUM
AD-619 369 DIV. 25

•ZAVARINA, M. V.
• • •
EXPERIMENTAL PROGNOSES
OF AIRCRAFT BUMPINESS BY A
DEFINED RICHARDSON CRITERION
AD-619 016 DIV. 1

•ZEMACH, C.
• • •
PHASE-SHIFT EQUATIONS
FOR MANY-CHANNEL PROBLEMS
AD-619 167 DIV. 20

•ZIMMERMAN, LORENZ E.
• • •
OCULAR COMPLICATIONS
OF STEROID THERAPY,
AD-619 186 DIV. 16

•ZISMAN, W. A.
• • •
REDUCTION OF POLYMERIC
FRICTION BY MINOR CONCENTRATIONS
OF PARTIALLY FLUORINATED COMPOUNDS.
AD-619 059 DIV. 14

•ZOLOTUKHIN, I. V.
• • •
STUDYING MECHANICAL AND
THERMAL FATIGUE OF METALS
BY THE INTERNAL FRICTION METHOD
AD-619 019 DIV. 17

CORPORATE AUTHOR - MONITORING AGENCY INDEX

•ADVANCED KINETICS INC COSTA MESA CALIF
• • •
PLASMA KINETIC ENERGY -RF CONVERSION. (RADC TDR-64-550)
AD-614 289 DIV. 8

•AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO
• • •
ACIC TP 18
GRAVITY DISTURBANCE COMPONENTS FROM A SPHERICAL HARMONIC EXPANSION OF THE DISTURBING POTENTIAL,
AD-613 956 DIV. 2

•AERONAUTICAL RESEARCH ASSOCIATES OF PRINCETON INC N J
• • •
COLLISIONS OF THREE HARD SPHERES, (AFOSR 65-0554)
AD-614 294 DIV. 25

•AERONAUTICAL SYSTEMS DIV AIR FORCE SYSTEMS COMMAND WRIGHT-PATTERSON AFB OHIO
• • •
TDR-62-509 V6
BERYLLIUM RESEARCH AND DEVELOPMENT PROGRAM. VOLUME VI. INFLUENCE OF THE DISTRIBUTION OF OXIDE AND THE TOTAL IMPURITY LEVEL ON RECRYSTALLIZATION AND GRAIN GROWTH OF BERYLLIUM.
AD-613 952 DIV. 17
• • •
TDR-63-316 V6
INTEGRATED SILICON DEVICE TECHNOLOGY. VOLUME VI. UNIPOLAR TRANSISTORS,
AD-613 951 DIV. 8

•AERONUTRONIC NEWPORT BEACH CALIF
• • •
U 1751
ESTIMATING METAL PARTICLE COMBUSTION KINETICS,
AD-614 563 DIV. 10

•AEROPROJECTS INC WEST CHESTER PA
• • •
ULTRASONIC WELDING PROCESS AND EQUIPMENT FOR CONSTRUCTION OF ELECTRON-TUBE MOUNTS,
AD-614 450 DIV. 26

•AEROSPACE CORP LOS ANGELES CALIF
• • •
TOR 269(4110 01) 30
SATELLITE CONTROL FACILITY, DESIGN CRITERIA: DIRECT CONNECTION FOR CDC-160A COMPUTER TO TELETYPE TRANSMISSION LINES,
AD-614 002 DIV. 12
• • •
TOR 269(4110 01) 39
SATELLITE CONTROL FACILITY, DESIGN CRITERIA: EXTENDING THE FREQUENCY RESPONSE OF THE REMOTE STATION TAPE RECORDER/REPRODUCER EQUIPMENT,
AD-614 003 DIV. 12

•AEROSPACE RESEARCH CENTER GENERAL PRECISION INC LITTLE FALLS N J
• • •
SOME PERIODIC SOLUTIONS OF A FOUR-BODY PROBLEM, (AFOSR 65-0617)
AD-614 295 DIV. 2

•AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO
• • •
65 10
TABLE OF HARTREE-FOCK SELF CONSISTENT FIELD WAVE FUNCTIONS WITH EXCHANGE,
AD-614 428 DIV. 2
• • •
65-2
TECHNIQUES FOR SOLVING NONEQUILIBRIUM EXPANDING FLOW PROBLEMS,
AD-614 457 DIV. 9

•AIR FORCE AERO PROPULSION LAB AIR FORCE SYSTEMS COMMAND WRIGHT-PATTERSON AFB OHIO
• • •
TR-65-12
COMPUTER ALGORITHM FOR FAULT ISOLATION AND TEST POINT SELECTION,
AD-613 960 DIV. 8

•AIR FORCE AVIONICS LAB RESEARCH AND TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
• • •
TDR-64-251
EXPERIMENTAL VERIFICATION OF STAR IDENTIFICATION BY OPTICAL RADIATION ANALYSIS,
AD-614 238 DIV. 19

•AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
• • •
AFCRL 63 919
PROCEEDINGS OF THE AFCRL SCIENTIFIC BALLOON SYMPOSIUM, HELD AT BOSTON, MASSACHUSETTS, 25-27 SEPTEMBER 1963,
AD-614 065 DIV. 1
• • •
AFCRL 65 126
A SYMBOLIC NOTATION APPLIED TO UNBALANCED LADDER NETWORKS,
AD-614 141 DIV. 8
• • •
AFCRL 65 195
PROJECT ANNA OPTICAL OBSERVATIONS,
AD-613 938 DIV. 2
• • •
AFSG 154
PROCEEDINGS OF THE AFCRL SCIENTIFIC BALLOON SYMPOSIUM, HELD AT BOSTON, MASSACHUSETTS, 25-27 SEPTEMBER 1963,
AD-614 065 DIV. 1
• • •
ERP 92
PROJECT ANNA OPTICAL OBSERVATIONS,
AD-613 938 DIV. 2
• • •
PSRP 82
A SYMBOLIC NOTATION APPLIED TO UNBALANCED LADDER NETWORKS,
AD-614 141 DIV. 8
• • •
64-874
MODEL ATMOSPHERES DETERMINED BY ABSORPTION OF SOLAR RADIATION
AD-614 085 DIV. 2
• • •
64-919
DIPOLE EXCITED UNIDIRECTIONALLY CONDUCTING SPHERE,
AD-614 078 DIV. 8
• • •
64-970 P 2
STUDIES OF THE PHYSICAL CHARACTERISTICS OF PROBABLE LUNAR SURFACE MATERIALS: PART II,
AD-613 965 DIV. 2
• • •
65-1
THE PRODUCTION OF INTENSE MAGNETIC FIELDS BY MEANS OF LIQUID NITROGEN COOLED COPPER COILS,
AD-613 967 DIV. 25
• • •
65-105
THEORY AND DESIGN OF FREQUENCY CONVERTERS USING COMBINATIONS OF PARAMETRIC ELEMENTS,
AD-614 122 DIV. 8
• • •
65-138
SATURATION PHENOMENA IN ZN2Y FERRITE AT FREQUENCIES BELOW RESONANCE,
AD-614 235 DIV. 25
• • •
65-154
DIGITIZING RIOMETER SYSTEM,
AD-614 247 DIV. 30
• • •
65-158
STUDY OF PLASMA AMPLIFIERS,
AD-614 253 DIV. 8
• • •
65-168
ANALYTICAL STUDY OF THE THERMODYNAMIC FACTORS CONTROLLING DIAMOND SYNTHESIS AND GROWTH AT HIGH PRESSURES AND TEMPERATURES,
AD-614 082 DIV. 25
• • •
65-170
INVESTIGATION OF THE THEORY OF ALGORITHMS WITH EMPHASIS ON PROGRAM SIMPLIFICATION,
AD-614 287 DIV. 30
• • •
65-174
FABRY-PEROT RESONANCES AT SMALL FRESNEL NUMBERS,
AD-614 063 DIV. 25
• • •
65-178
PRESERVATION OF UNAMBIGUITY AND INHERENT AMBIGUITY IN CONTEXT FREE LANGUAGES,
AD-614 073 DIV. 30
• • •
65-179
RELATIVE ADVANTAGES OF INTERFEROMETER OVER TELESCOPE FOR MEASURING SOURCE SIZES,
AD-614 248 DIV. 30
• • •
65-181
RESTORATION OF OPTICAL PATTERNS,
AD-614 272 DIV. 30
• • •
65-192
THE ADIABATIC LINEAR STARK EFFECT IN A PLASMA,
AD-614 283 DIV. 25
• • •
65-199
DIFFRACTION AND SCATTERING BY REGULAR BODIES,
AD-614 046 DIV. 8
• • •
65-200 P1
RESULTS OF SIMULTANEOUS ELF MEASUREMENTS AT BRANNENBURG GERMANY AND KINGSTON, R. I,
AD-614 012 DIV. 2
• • •
65-204
RESEARCH ON BASIC FAR-INFRARED TECHNIQUES,
AD-613 966 DIV. 30
• • •
65-207
ON FACTORING THE CORRELATIONS OF DISCRETE MULTI-VARIABLE STOCHASTIC PROCESSES,

AD-614 040 DIV. 15

• • •

65-224
RESEARCH ON MEASUREMENT OF PRESSURE INDUCED SHIFTS OF ABSORPTION LINES IN THE INFRARED SPECTRUM.
AD-614 234 DIV. 25

• • •

65-227
THEORY OF COHERENCE FOR THE QUANTIZED ELECTROMAGNETIC FIELD,
AD-614 062 DIV. 25

• • •

65-228
RESONANCES IN THE SPECTRAL ENERGY DENSITY OF THERMAL FIELDS AND SPONTANEOUS EMISSION
AD-614 061 DIV. 25

• • •

65-65
RESEARCH OF AERODYNAMIC METHODS OF PRODUCING ANTENNA WINDOWS IN A PLASMA SHEATH.
AD-614 084 DIV. 8

• • •

65-84
ELECTROMAGNETIC WAVE PROPAGATION IN ANISOTROPIC PLASMAS ALONG THE DIRECTION OF A STATIC MAGNETIC FIELD
AD-614 442 DIV. 25

• • •

89 ARCRL 65 132
IONOSPHERIC AND TROPOSPHERIC SCINTILLATIONS OF A RADIO STAR AT ZERO TO FIVE DEGREES OF ELEVATION.
AD-614 161 DIV. 2

•AIR FORCE FLIGHT DYNAMICS LAB RESEARCH AND TECHNOLOGY DIV WRIGHT-PATTERSON AFB

• • •

TDR-64-82
A CONICAL THIN-SHOCK-LAYER THEORY UNIFORMLY VALID IN THE ENTROPY LAYER,
AD-614 444 DIV. 9

• • •

TR-64-171
TRANSDUCERS FOR SONIC FATIGUE MEASUREMENTS,
AD-613 946 DIV. 30

•AIR FORCE MATERIALS LAB AIR FORCE SYSTEMS COMMAND WRIGHT-PATTERSON AFB OHIO

• • •

TR 64 405
STATIONARY STATE CRITERION FOR FREE RADICAL POLYMERIZATION FOR LINEARLY INCREASING REACTION TEMPERATURE.
AD-614 077 DIV. 4

• • •

TR 65 10
THE INVESTIGATION OF MICROSTRUCTURE IN STRUCTURAL CERAMICS,
AD-614 076 DIV. 14

• • •

TR-65-5
FRICTION AND WEAR BEHAVIOR OF SOLID FILMS.
AD-614 242 DIV. 14

•AIR FORCE OFFICE OF SCIENTIFIC RESEARCH WASHINGTON D C

• • •

AFOSR 65 0490
CONVERSATION ON INDIAN LIBRARIES,
AD-614 190 DIV. 32

• • •

TN-60-1314
EVOKED ACTIVITY IN THE CAUDATE NUCLEUS OF THE CAT IN RESPONSE TO VARIOUS KINDS OF AFFERENT STIMULI. I. MACROPHYSIOLOGICAL STUDY (ACTIVITES EVOQUEES DANS LE NOYAU CAUDE DU CHAT EN REPONSE A DES TYPES DIVERS D'AFFERENCES. I. ETUDE MACROPHYSIOLOGIQUE,
AD-614 510 DIV. 16

• • •

TN-60-204
POLYMORPHISM OF RARE EARTH DISILICIDES,
AD-614 137 DIV. 25

• • •

119
EXPERIMENTS ON DYNAMIC POLARIZATION OF PROTONS IN POLYETHYLENE BY THE 'SOLID EFFECT'. A PROPOSED POLARIZED PROTON TARGET,
AD-614 145 DIV. 20

• • •

386
PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON COLD ACCLIMATION HELD AT INSTITUTO ANTARTICO ARGENTINO, BUENOS AIRES, AUGUST 5-7, 1959.
AD-614 146 DIV. 16

• • •

4611
ON THE OSCILLATIONS OF THE MACLAURIN SPHEROID BELONGING TO THE THIRD HARMONICS,
AD-614 155 DIV. 2

• • •

4612
ON THE STABILITY OF THE JACOBI ELLIPSOIDS,
AD-614 156 DIV. 2

• • •

65 0481
FALLING CHARGES,
AD-614 166 DIV. 25

• • •

65-0192
MOLECULAR BEAM VELOCITY DISTRIBUTION MEASUREMENTS
AD-614 230 DIV. 9

• • •

65-044
MILLIMETER WAVE GENERATION BY MULTIPLE QUANTUM CONVERSION.

AD-614 092 DIV. 8

• • •

65-0450
THE STELLAR INTERFEROMETER AT NARRABRI.
AD-614 536 DIV. 2

• • •

65-0453
ON THE CONCEPTION OF GENERALIZED SPIN OF FREE DIRAC PARTICLES,
AD-614 219 DIV. 25

• • •

65-0454
THE GENERAL ORTHOGONALITY THEOREM IN THE HYLLERAAS-SCHERR-KNIGHT VARIATIONAL PERTURBATION METHOD,
AD-614 220 DIV. 25

• • •

65-0458
CODING AND TRANSMISSION IN THE VISUAL SYSTEM.
AD-614 486 DIV. 16

• • •

65-0459
ATROPINE DETOXICATION DURING HYPOTHERMIA BY THE ISOLATED PERFUSED RAT LIVER,
AD-614 068 DIV. 16

• • •

65-0462
PRACTICLE THEORY OF THREE-PARTICLE STATES. I. NONRELATIVISTIC,
AD-614 493 DIV. 20

• • •

65-0463
ABSORPTION OF SIGMA(-) HYPERONS IN PHOTOGRAPHIC EMULSION NUCLEI,
AD-614 213 DIV. 20

• • •

65-0464
A DETERMINATION OF THE SPIN OF LITHIUM 8 HYPERNUCLEUS
AD-614 187 DIV. 20

• • •

65-0468
SOLAR FLARE HIGH ENERGY ALPHA PARTICLES AND THEIR STORAGE IN INTERPLANETARY SPACE,
AD-614 217 DIV. 2

• • •

65-0471
SOME POSSIBILITIES FOR UNUSUAL LIGHT HYPERNUCLEI
AD-614 539 DIV. 20

• • •

65-0478
ASYMPTOTIC BEHAVIOR FOR LARGE IMAGINARY VALUES OF ANGULAR MOMENTUM OF THE AMPLITUDES FOR THE SCATTERING OF A DIRAC PARTICLE ON A CENTRAL SCALAR POTENTIAL,
AD-614 206 DIV. 25

• • •

65-0479
ON MASSIVE AND MASSLESS PHOTONS,
AD-614 184 DIV. 25

• • •

65-0493
PHASE-SHIFT EQUATIONS FOR MANY-CHANNEL PROBLEMS
AD-614 167 DIV. 20

• • •

65-0494
CONSIDERATIONS ON THE ISOBAR MECHANISM AND RESONANCE POLES FOR PION-BARYON SYSTEMS
AD-614 143 DIV. 20

• • •

65-0495
POSSIBLE EXPERIMENTAL CONSEQUENCES OF TRIANGLE SINGULARITIES IN STRANGE-PARTICLE PRODUCTION PROCESSES,
AD-614 144 DIV. 20

• • •

65-0496
ENERGY PEAKS FOR THREE-BODY MESON SYSTEMS,
AD-614 150 DIV. 20

• • •

65-0497
MESON EFFECTS IN N-P CAPTURE,
AD-614 151 DIV. 20

• • •

65-0498
MESON-BARYON SYSTEMS AND THEIR RESONANCES,
AD-614 152 DIV. 20

• • •

65-0499
CROSSING RELATIONS AND LEGENDRE EXPANSIONS IN PION-PION SCATTERING,
AD-614 153 DIV. 20

• • •

65-0500
THE PHI-OMEGA MIXING ANGLE,
AD-614 171 DIV. 20

• • •

65-0501
SU(3) SYMMETRY AND THE NONLEPTONIC K-MESON PROCESSES
AD-614 172 DIV. 20

• • •

65-0502
THREE-PARTICLE UNITARITY INTEGRAL,
AD-614 173 DIV. 25

• • •

65-0504
REMARKS ON STRANGENESS NON-CONSERVING WEAK LEPTONIC INTERACTIONS,
AD-614 174 DIV. 20

• • •

65-0505
UNITARY SYMMETRY AND NON-LEPTONIC K-DECAYS,
AD-614 179 DIV. 20

• • •

65-0506
DYNAMICAL MODEL OF THE 1535-MEV XI* HYPERON,
AD-614 176 DIV. 20

• • •

65-0507
COUPLING OF INTERNAL AND SPACE-TIME SYMMETRIES
AD-614 181 DIV. 20

• • •

65-0508
SCATTERING OF PIONS BY LIGHT NUCLEI,
AD-614 087 DIV. 20

• • •

65-0509
DISCUSSION OF PAPER BY F. J. STEGELMANN AND C. H. VON KENSCHITZKI, 'ON THE INTERPRETATION OF THE SUDDEN COMMENCEMENT OF GEOMAGNETIC STORMS'
AD-614 168 DIV. 2

• • •

65-0513
SEMANTIC BASIS OF COMMUNICATION.
AD-614 093 DIV. 32

• • •

65-0516
THE REARRANGEMENT OF AROMATIC N-NITROAMINES. PART III. THE ACID-CATALYSED REARRANGEMENT OF N-NITROANILINE,
AD-614 215 DIV. 4

• • •

65-0517
SOAP FILMS AND SOME PROBLEMS IN SURFACE AND COLLOID CHEMISTRY
AD-614 293 DIV. 4

• • •

65-0524
VOLTAMMETRY AND ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF HALONITROBENZENE ANION RADICALS,
AD-614 291 DIV. 4

• • •

65-0525
CORRELATION OF SOLVENT EFFECTS ON ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF THE NITROBENZENE ANION RADICAL,
AD-613 924 DIV. 4

• • •

65-0527
OPERATIONAL AMPLIFIER CIRCUITS FOR CONTROLLED POTENTIAL CYCLIC VOLTAMMETRY, II,
AD-614 195 DIV. 4

• • •

65-0530
APPLICATION OF ELECTRON PARAMAGNETIC RESONANCE TECHNIQUES IN ELECTROCHEMISTRY,
AD-614 538 DIV. 4

• • •

65-0532
SYNTHESIS OF A SILAZAROPHENANTHRENE,
AD-613 923 DIV. 4

• • •

65-0533
LEWIS ACID ADDUCTS OF GROUP IV-A AZIDES,
AD-613 920 DIV. 4

• • •

65-0534
A NOVEL REARRANGEMENT OF 1,2-BIS (TRIMETHYLSILYL)-HYDRAZINE,
AD-614 290 DIV. 4

• • •

65-0536
PYROLYSIS STUDIES. XII. STERIC INHIBITION OF RESONANCE IN THE VAPOR PHASE,
AD-613 921 DIV. 4

• • •

65-0537
NONBENZENOID AROMATIC SYSTEMS. I. SYNTHESIS OF 1-VINYLAZULENE AND CERTAIN SUBSTITUTED 1-VINYLAZULENES
AD-614 491 DIV. 4

• • •

65-0539
GUEST-HOST INTERACTIONS: AN EXAMINATION OF THE SOLVENT-INDUCED SPECTRAL SHIFT IN A MODEL SYSTEM,
AD-614 289 DIV. 25

• • •

65-0540
CYCLOPENTADIENYLCOBALT CARBONYL DIIODIDE,
AD-614 540 DIV. 4

• • •

65-0544
COLLISIONS OF THREE HARD SPHERES,
AD-614 294 DIV. 25

• • •

65-0547
THE VISCOUS INCOMPRESSIBLE FLOW INSIDE A CONE,
AD-614 492 DIV. 9

• • •

65-0559
THE PROPAGATION OF ACOUSTIC WAVES THROUGH THE SOLAR CHROMOSPHERE.
AD-613 914 DIV. 2

• • •

65-0565
SHOCK-WAVE PROPAGATION IN LIQUID PROPELLANT ROCKET ENGINES.
AD-614 201 DIV. 27

• • •

65-0566
CURRENT DISTRIBUTION IN A MAGNETIC ANNULAR SHOCK-TUBE.
AD-614 212 DIV. 30

• • •

65-0568
THE ANHARMONICITY CORRECTION FOR POLYATOMIC MOLECULES. PART II. METHANE,
AD-614 088 DIV. 25

• • •

65-0569
THE ANHARMONICITY CORRECTION FOR POLYATOMIC MOLECULES. PART I. METHODS AND APPLICATION TO CH2O,
AD-614 177 DIV. 25

• • •

65-0570
THE EFFECT OF SUBSTITUTION ON THE IONIZATION POTENTIALS OF FREE RADICALS AND MOLECULES. VII. THEORETICAL RATIONALIZATION FOR DIFFERING CORRELATIONS FOUND FOR BOND DISSOCIATION ENERGIES WITH IONIZATION POTENTIALS AND ELECTRON AFFINITIES OF ORGANIC OR INORGANIC RADICALS
AD-613 922 DIV. 4

• • •

65-0571
LCAO-MO SCF CALCULATIONS OF C6O6 SYSTEMS,
AD-614 192 DIV. 4

• • •

65-0582
COGNITRON THEORY,
AD-614 006 DIV. 30

• • •

65-0587
METHODOLOGY FOR TEST AND EVALUATION OF INFORMATION RETRIEVAL SYSTEMS,
AD-614 005 DIV. 32

• • •

65-0597
HYPERSONIC VISCOUS FLOW NEAR THE STAGNATION STREAMLINE OF A BLUNT BODY: I. A TEST OF LOCAL SIMILARITY.
AD-613 915 DIV. 9

• • •

65-0598
HYPERSONIC VISCOUS FLOW NEAR THE STAGNATION STREAMLINE OF A BLUNT BODY: II. THIRD ORDER BOUNDARY-LAYER THEORY AND COMPARISON WITH OTHER METHODS.
AD-613 916 DIV. 9

• • •

65-0602
EQUIVALENCE OF CERTAIN INEQUALITIES COMPLEMENTING THOSE OF CAUCHY-SCHWARZ AND HOLDER,
AD-614 198 DIV. 15

• • •

65-0604
FARADAY EFFECT IN SOLIDS
AD-614 558 DIV. 25

• • •

65-0605
BAND STRUCTURE AND MAGNETISM OF GADOLINIUM METAL,
AD-614 557 DIV. 25

• • •

65-0609
UNITARY SYMMETRY AND WEAK INTERACTIONS. II. SU(3) TRANSFORMATION PROPERTIES
AD-614 154 DIV. 20

• • •

65-0611
NEW TRIPHENYLPHOSPHINE HYDRIDES OF RHENIUM (NUOVI IDRURI TRIFENILFOSFINICI DI RENIO),
AD-614 207 DIV. 4

• • •

65-0617
SOME PERIODIC SOLUTIONS OF A FOUR-BODY PROBLEM,
AD-614 295 DIV. 2

• • •

65-0618
THE SIGNIFICANCE OF SINGULAR CONFIGURATIONS OF STRUCTURES FROM THE STRENGTH OF MATERIALS POINT OF VIEW,
AD-614 541 DIV. 25

• • •

65-0621
SINGULAR NETWORK ELEMENTS.
AD-613 919 DIV. 8

• • •

65-0624
GENERALIZED RATIONAL APPROXIMATION,
AD-614 528 DIV. 15

• • •

65-0627
A STABILITY CRITERION FOR PULSE-WIDTHMODULATED FEEDBACK CONTROL SYSTEMS.
AD-614 489 DIV. 30

• • •

65-0630
ANALYSIS AND SYNTHESIS OF STABLE LINEAR SEQUENTIAL CIRCUITS,
AD-614 164 DIV. 30

• • •

65-0653
ANTENNA RADIATION IN A MOVING DISPERSIVE MEDIUM
AD-614 275 DIV. 8

• • •

65-0656
FUNDAMENTAL PROBLEMS OF SOLIDS.
AD-614 136 DIV. 25

• • •

65-0661
STUDIES IN QUANTUM AND SOLID STATE ELECTRONICS.
AD-614 007 DIV. 25

• • •

65-0662
THE OXIDATION OF ARSENIC

(III) AND ANTIMONY (III).
AD-619 476 DIV. 4

• • •

65-0664
SMOOTH MUSCLE RESPONSES AS ALTERED BY HUMORAL BACKGROUND.
AD-619 478 DIV. 16

• • •

65-0665
THE METABOLISM OF SIMPLE CARBON COMPOUNDS IN MICRO-ORGANISMS.
AD-619 479 DIV. 16

• • •

65-0682
AUTO-AND CROSS-CORRELATION FUNCTIONS USED AS TOOLS FOR INFORMATION RETRIEVAL IN ELECTRON DIFFRACTION STRUCTURE STUDIES
AD-619 534 DIV. 25

• • •

880
NATURE OF THE RESONANCE IN THE STATIC PION-NUCLEON SCATTERING IN ONE-MESON APPROX IMATION.
AD-613 934 DIV. 20

*AIR FORCE WEAPONS LAB KIRTLAND APB N MEX

• • •

TDR-64-94
DESIGN OF A HIGH-ENERGY FAST-PULSE POWER SYSTEM, PHASE II.
AD-613 959 DIV. 7

• • •

TR-64-108
EFFECTS OF BOUNDARY FRICTION ON TRANSMISSION OF STATIC STRESS THROUGH AND IN CYLINDRICAL TANKS.
AD-619 108 DIV. 13

• • •

TR-64-137
AN INVESTIGATION OF THE THERMAL RESPONSE OF THE AEROSPACE SHIELD TEST REACTOR TO LOSS OF COOLANT.
AD-619 452 DIV. 20

• • •

TR-64-138
COMPUTER CODES FOR REACTOR AND HAZARD ANALYSES AT NARF.
AD-613 983 DIV. 30

• • •

TR-64-140
THE INTERACTIONS OF 14.6-MEV NEUTRONS IN IRON, LITHIUM-7, AND CARBON.
AD-619 451 DIV. 20

• • •

TR-64-145
REACTOR INSTRUMENTATION RESPONSE TO INCORE VOID FORMATION.
AD-619 037 DIV. 20

• • •

TR-64-146
FIRST TEST ON RADIATION EXPERIMENTATION FOR THE Q-FACTOR TECHNIQUE.
AD-619 112 DIV. 8

• • •

TR-64-151
FORMULATION OF RADIATION TRANSPORT SOLUTIONS FOR SHIELDING APPLICATIONS, INCLUDING INTEGRAL TRANSFORM METHODS, MATRIX TECHNIQUES, AND ASYMPTOTIC APPROXIMATIONS.
AD-619 250 DIV. 20

• • •

TR-64-157
A STUDY OF THE BEHAVIOR OF SOIL AND ROCK SUBJECTED TO HIGH STRESS LEVELS.
AD-619 481 DIV. 13

• • •

TR-64-160
DEVELOPMENT AND APPLICATION OF NUCLEAR MEASUREMENT TECHNIQUES.
AD-619 109 DIV. 16

• • •

TR-64-161
COLD-NEUTRON SCATTERING CROSS SECTION OF LIQUID HYDROGEN BASED ON A CONSISTENTVIBRATIONS LIQUID MODEL.
AD-619 038 DIV. 25

• • •

TR-64-162
A CONSISTENT-VIBRATIONS MODEL OF THE INTERNAL DYNAMICS OF LIQUID HYDROGEN.
AD-619 039 DIV. 25

*AIRTRON INC MORRIS PLAINS N J

• • •

R11 473
HYDROTHERMAL GROWTH OF CRYSTALS OF LAALO3.
AD-619 229 DIV. 14

*ALLOYD GENERAL CORP CAMBRIDGE MASS

• • •

THE DIMENSIONAL STABILITY OF SELECTED ALLOY SYSTEMS.
AD-613 931 DIV. 17

*AMERICAN INST FOR RESEARCH PALO ALTO CALIF

• • •

SELF-EVALUATIONAL RESPONDING AND TYPOGRAPHICAL CUEING: TECHNIQUES FOR PROGRAMING SELF-INSTRUCTIONAL READING MATERIALS.
AD-619 316 DIV. 23

• • •

TYPOGRAPHICAL CUING IN CONVENTIONAL AND PROGRAMED TEXTS.
AD-619 317 DIV. 23

*AMERICAN METEOROLOGICAL SOCIETY BOSTON MASS

• • •

T R 450
SIMULATION OF PARTICLE MOTION IN INTERSECTING ELECTRIC AND MAGNETIC FIELDS, (TT 65-61979)
AD-613 980 DIV. 25

• • •

T R 45b
CALIBRATION OF RADIOSONDES AT TEMPERATURES TO MINUS 100 DEGREES C, (TT 65-61978)
AD-613 979 DIV. 2

• • •

T R 460
USE OF RADIO DATA TO DETERMINE THE POSITION OF THE REGION IN WHICH THE CHARAC TERISTICS OF THE SOLAR ATMOSPHERE CHANGE RAPIDLY, (TT 65-61980)
AD-613 981 DIV. 2

• • •

T R 462
OBSERVATIONAL DATA FROM THE ANNULAR SOLAR ECLIPSE OF 31 JULY 1962, (TT 65-61977)
AD-613 978 DIV. 2

• • •

T RC 23
IRREGULARITY STRUCTURE AND MOVEMENT IN THE IONOSPHERE (SELECTED PASSAGES), (TT 65-61981)
AD-613 982 DIV. 2

*AMERICAN OPTICAL CO SOUTHBRIDGE MASS

• • •

NEODYMIUM LASER GLASS IMPROVEMENT PROGRAM.
AD-613 963 DIV. 25

*ANTENNA LAB CALIF INST OF TECH PASADENA

• • •

TR 24
ANTENNA RADIATION IN A MOVING DISPERSIVE MEDIUM (AFOSR 65-0653)
AD-619 275 DIV. 8

*APPLIED PHYSICS LAB JOHNS HOPKINS UNIV SILVER SPRING MD

• • •

HANDBOOK OF SUPERSONIC AERODYNAMICS, VOLUME 5, SECTION 15. PROPERTIES OF GASES. (NAVORD 1488 V5)
AD-613 972 DIV. 9

*ARINC RESEARCH CORP WASHINGTON D C

• • •

SYSTEM RELIABILITY PREDICTION BY FUNCTION, (RADC TDR-63-300 SUPPL 1)
AD-619 227 DIV. 8

*ARIZONA UNIV TUCSON

• • •

WAVELENGTH DEPENDENCE OF POLARIZATION. III. THE LUNAR SURFACE,
AD-619 170 DIV. 2

*ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C

• • •

SPECIFICITY OF GUINEA-PIG ANTIBODIES AND DELAYED HYPERSENSITIVITY,
AD-619 179 DIV. 16

• • •

OCULAR COMPLICATIONS OF STEROID THERAPY,
AD-619 186 DIV. 16

• • •

SPONGY DEGENERATION OF THE NERVOUS SYSTEM; A REPORT OF FOUR CASES WITH A REVIEW OF THE LITERATURE,
AD-619 337 DIV. 16

*ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD

• • •

CRDL SP 3 21
REACTIONS OF ISOPROPYL METHYLPHOSPHONOFLUORIDATE WITH SUBSTITUTED PHENOLS. II,
AD-619 304 DIV. 4

• • •

CRDLR 3250
PHOTOCHEMICAL SYNTHESIS OF ANTIISONICOTINALDEHYDE OXIME.
AD-619 245 DIV. 16

• • •

CRDLR 3257
UNBALANCED GROWTH AND LATENT KILLING OF ESCHERICHIA COLI FOLLOWING EXPOSURE TO SULFUR MUSTARD.
AD-619 284 DIV. 16

• • •

CRDLR 3260
ELIMINATION OF SULFUR MUSTARD-INDUCED ALKYLATION PRODUCTS FROM DNA OF ESCHERICHIA COLI,
AD-619 267 DIV. 16

• • •

CRDLR 3266
DPN-LINKED CYTOPLASMIC METABOLITES IN THE RAT-LEG MUSCLE, IN SITU, DURING CONTRACTION AND RECOVERY.
AD-619 246 DIV. 16

• • •

CRDLR 3270
USE OF ISOPROTERENOL

AND PHENOXYBENZAMINE IN TREATMENT OF ENDOTOXIN SHOCK,
AD-614 266 DIV. 16

*ARMY COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER N H

• • •

SOME CHARACTERISTICS OF BLACK SPHERULES,
AD-614 188 DIV. 2

• • •

RR 112
AGE HARDENING OF SNOW AT THE SOUTH POLE,
AD-614 430 DIV. 13

• • •

RR 169
COMPLEX POISSON'S RATIO AND DILATATION CONSTANTS FROM FORCED VIBRATION OF A SPHERE
AD-614 461 DIV. 25

• • •

TR 128
SURVEY OF SNOW AND ICE REMOVAL TECHNIQUES,
AD-614 431 DIV. 33

*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J

• • •

ECOM 2510
TUNABLE PRESELECTION THROUGH PARAMETRIC CONVERSION
AD-614 027 DIV. 8

• • •

ECOM 2559
THE EFFECT OF CARBONATED ELECTROLYTE ON THE PERFORMANCE OF SINTERED PLATE NICKELCADMIUM CELLS,
AD-614 104 DIV. 7

*ARMY ELECTRONICS LABS FORT MONMOUTH N J

• • •

DOWNWARD ELECTRON FLUX AT 1,000 KM ALTITUDE FROM ELECTRON CONTENT MEASUREMENT AT MID-LATITUDES,
AD-614 203 DIV. 2

• • •

RESONANT FREQUENCY MIXING EFFECTS IN DISTRIBUTED MEDIA.
AD-614 208 DIV. 25

• • •

CRITERIA FOR OPTICAL MASER AMPLIFIERS AND OSCILLATORS.
AD-614 209 DIV. 25

• • •

CURIE POINT MEASUREMENT AT HIGH PRESSURE BY A SINGLE COIL TECHNIQUE,
AD-614 322 DIV. 30

• • •

DETERMINATION OF RADIAL DISTRIBUTION OF VOLUME RADIANCE OF A LUMINOUS MEDIUM CONFINED IN A GLASS CYLINDER,
AD-614 328 DIV. 25

• • •

FUEL CELL ELECTRODES FOR ACID MEDIA,
AD-614 329 DIV. 7

*ARMY ENGINEER RESEARCH AND DEVELOPMENT LABS FORT BELVOIR VA

• • •

T 1762 65
THE USD-1 DROBYSHEV UNIVERSAL STEREOGRAPH,
(TT 65-62036)
AD-614 107 DIV. 2

• • •

T 1769 65
THE PHOTOGRAMMETRIC PARAMETERS OF THE CAMERA OF A PHOTOGRAPHIC APPARATUS,
(TT 65-62034)
AD-614 108 DIV. 2

• • •

T 1769 65
USE OF TRANSPARENT PLASTICS IN STEREOTOPOGRAPHIC WORK
(TT 65-62035)
AD-614 106 DIV. 2

• • •

T 1781 65
GROWTH OF SINGLE-CRYSTALS NEMATIC FILMS,
(TT 65-61982)
AD-613 984 DIV. 25

• • •

T 1782 65
VITRIFIED LIQUID-CRYSTAL FILMS,
(TT 65-61984)
AD-613 986 DIV. 25

• • •

T 1783 65
TYPE OF GROWTH AND PROPERTIES OF LIQUID CRYSTALS OF THIAZINE DYES,
(TT 65-61983)
AD-613 985 DIV. 25

*ARMY INFANTRY HUMAN RESEARCH UNIT FORT BENNING GA

• • •

SOME DETERMINANTS OF SMALL-GROUP EFFECTIVENESS.
(HUMRRO RM-26)
AD-613 954 DIV. 28

*ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS

• • •

AMRA TR 64 42
HOMOGENIZATION OF HIGH-STRENGTH STEEL AT 2500 F,
AD-614 277 DIV. 26

• • •

AMRA TR 64 44
ULTRASONIC SPECTROSCOPY OF STEEL,
AD-614 113 DIV. 26

• • •

AMRA TR 64 50
A STUDY OF THE EFFECT OF HEAT TREATMENT ON THE MICRO STRUCTURE AND PROPERTIES OF SPRAYED MOLYBDENUM,
AD-614 127 DIV. 26

• • •

TR 64 48
SLOW BEND-TENSION TEST CORRELATIONS OF SHORT BEAMS WITH SPECIAL REFERENCE TO THE CHARPY-TYPE SPECIMEN,
AD-614 095 DIV. 30

• • •

TR 64 51
THE USE OF THE CRITICAL THICKNESS CONCEPT IN DESIGN
AD-614 094 DIV. 27

*ARMY MEDICAL RESEARCH LAB FORT KNOX KY

• • •

TR-64-129
PROGRAMMING METHOD AND RESPONSE MODE IN A VISUAL ORAL TASK.
AD-614 014 DIV. 28

• • •

TR-64-140
DEVELOPMENT OF A CARBON DIOXIDE PARTIAL PRESSURE SENSOR.
AD-614 226 DIV. 16

• • •

TR-65-24
INFORMATION PROCESSING IN THE FROG'S RETINA.
AD-614 249 DIV. 16

*ARMY MEDICAL UNIT FORT DETRICK MD

• • •

STUDIES ON ANTHRAX INFECTIONS IN IMMUNIZED GUINEA PIGS,
AD-614 321 DIV. 16

*ARMY NATICK LABS MASS

• • •

FD 6
INDUCED RADIOACTIVITY IN FOOD AND ELECTRON STERILIZATION
AD-613 950 DIV. 29

*ARMY PERSONNEL RESEARCH OFFICE OFFICE OF THE CHIEF RESEARCH AND DEVELOPMENT WASHINGTON

• • •

TRR 1141
RESTANDARDIZATION OF THE ARMED FORCES WOMEN'S SELECTION TEST, AFWST 5 AND 6,
AD-614 400 DIV. 23

*ARMY RESEARCH OFFICE DURHAM N C

• • •

1517:71
HARMONIC FUNCTIONS WITH GIVEN VALUES AND MINIMUM NORMS IN RIEMANNIAN SPACES,
AD-614 543 DIV. 15

• • •

2160:16
PRODUCTS BETWEEN HOMOTOPY GROUPS AND THE J-MORPHISM
AD-614 157 DIV. 15

• • •

2397:5
TEMPERATURE DEPENDENCE OF THE LIFETIME OF PHOSPHORESCENCE OF SOME POLYNUCLEAR HYDROCARBONS IN VISCOUS SOLUTION,
AD-614 530 DIV. 4

• • •

2805:11
CHARGE-STATE CORRELATIONS IN AR(+) -AR COLLISIONS,
AD-614 545 DIV. 25

• • •

2810:7
PHOTOIONIZATION CROSS SECTION OF HELIUM IN THE 100- TO 250-A REGION,
AD-614 533 DIV. 25

• • •

2884:31
FABRICATION AND FRACTURE OF POLYCRYSTALLINE NIO.
AD-614 263 DIV. 14

• • •

2884:4
MECHANICAL BEHAVIOR OF POLYCRYSTALLINE CERAMICS.
AD-614 265 DIV. 14

• • •

3242:2
INTERACTION OF A STARTING VORTEX AS WELL AS A VORTEX STREET WITH A TRAVELING SHOCK WAVE.
AD-614 311 DIV. 9

• • •

3259:3
NEUTRON DIFFRACTION STUDIES OF THE ORDER OF THE ATOMS IN THE P PHASE AND THE R PHASE
AD-614 149 DIV. 25

• • •

3269:9
RADIATIVE CAPTURE OF HE3 BY LI7,
AD-614 515 DIV. 20

• • •

3298:14
DISTANCE MATRIX OF A GRAPH AND ITS REALIZABILITY
AD-614 559 DIV. 15

• • •

3298:15
THE SENSITIVITY OF A TRAFFIC NETWORK,
AD-614 560 DIV. 8

• • •

3298:16
A NOTE ON ACTIVE RC REALI ZATION OF VOLTAGE TRANSFER FUNCTIONS.
AD-614 554 DIV. 8

• • •

3911:2
ELECTRON-ION RECOMBINATION IN NITROGEN,
AD-614 160 DIV. 2

• • •

3581:7
RING METALATION OF DIMETH YLAMINOMETHYLFERROCENE WITH RUTYLLITHIUM AND CONDENSATIONS WITH ELECTROPHILIC COMPOUNDS. SYNTHESIS OF 1,?-DISUBSTITUTED FERROCENES,
AD-614 544 DIV. 4

• • •

3605:1
ARYL BORON FREE RADICALS
AD-614 547 DIV. 4

• • •

362:65
OPTIMUM STRATIFICATION WITH TWO CHARACTERS,
AD-614 526 DIV. 15

• • •

362:66
CONSISTENT ESTIMATES AND ZERO-ONE SETS,
AD-613 917 DIV. 15

• • •

3655:12
DETERMINATION OF ELECTRON RELAXATION TIME FROM THE GIANT QUANTUM OSCILLATIONS IN THE ACOUSTIC ABSORPTION OF METALS
AD-614 527 DIV. 25

• • •

3956:4
THERMODYNAMIC PROPERTIES OF AQUEOUS SOLUTIONS OF MIXED ELECTROLYTES. THE HYDROCHLORIC ACID-POTASSIUM CHLORIDE SYSTEM FROM 40 TO 0C,
AD-614 555 DIV. 4

• • •

4017:6
TUNNELING PROCESSES ACROSS THE CDSELECTROLYTE INTERFACE
AD-614 494 DIV. 25

• • •

4168:2
DIFFUSION IN ORGANIC CRYSTALS. I. SELFDIFFUSION IN ANTHRACENE,
AD-614 531 DIV. 25

• • •

4313:6
A QUANTUM MECHANICAL EVALUATION OF LINE BREADTHS INVOLVED IN TUNED-LASER ABSORPTION AND STIMULATED EMISSION SPECTR OSCOPY,
AD-614 383 DIV. 25

• • •

4397:1
ON THE CONTACT ANGLE IN HETEROGENEOUS NUCLEATION UPON A SUBSTRATE,
AD-614 542 DIV. 25

• • •

4706:1
PHOTOCONDUCTIVITY OF ANTHRACENE,
AD-614 197 DIV. 25

• • •

893:100;
ANALYSIS OF NUCLEON TRANSFER DATA,
AD-614 089 DIV. 20

•ARMY TRANSPORTATION RESEARCH COMMAND FORT EUSTIS VA

• • •

TR-64-69
EFFECTS OF TASK LOADING ON PILOT PERFORMANCE DURING SIMULATED LOW-ALTITUDE HIGH SPEED FLIGHT,
AD-614 243 DIV. 28

• • •

TR-65-12
A DEVICE FOR THE DIRECT MEASUREMENT OF UNSTEADY AIR FLOWS AND SOME CHARACTERISTICS OF BOUNDARY LAYER TRANSITION.
AD-614 008 DIV. 9

• • •

TR-65-2
DEVELOPMENT OF A CRASHWORTHY, ARMORED, UNIVERSAL CREW SEAT FOR U. S. ARMY AIRCRAFT.
AD-614 231 DIV. 1

•ATLANTIC REGIONAL LAB HALIFAX (NOVA SCOTIA)

• • •

NRC 8239
PHENOLIC ACIDS AND LIGNINS IN THE LYCOPODIALES,
AD-614 513 DIV. 4

•ATOMIC ENERGY OF CANADA LTD CHALK RIVER (ONTARIO)

• • •

A.E.C.L. 2052
THE RESOLUTION FUNCTION OF A TWO-ROTOR NEUTRON VELOCITY SELECTOR,
AD-614 221 DIV. 20

•AUDITORY RESEARCH LABS PRINCETON UNIV N J

• • •

AUDITORY RESPONSES IN THE ALLIGATOR LIZARD,
AD-614 339 DIV. 16

• • •

FURTHER STUDIES OF HEARING IN THE GEKKONID LIZARDS,
AD-614 340 DIV. 16

•AVCO EVERETT RESEARCH LAB EVERETT MASS

• • •

CURRENT DISTRIBUTION IN A MAGNETIC ANNULAR SHOCK TUBE,
(AFOSR 65-0566)
AD-614 212 DIV. 20

•BATTELLE MEMORIAL INST COLUMBUS OHIO

• • •

RELIABILITY OF INTEGRATED CIRCUITS USED IN MISSILE SYSTEMS (RSIC 330)
AD-614 103 DIV. 8

•BELL TELEPHONE LABS INC MURRAY HILL N J

• • •

HIGH-FIELD MAGNETORESISTANCE OF INHOMOGENEOUS SEMICONDUCTORS AND PLASMAS. III. TWO-DIMENSIONAL INHOMOGENEITY DISTRIBUTIONS
AD-614 163 DIV. 25

•BENDIX FIELD ENGINEERING CORP OWINGS MILLS MD

• • •

ERROR ANALYSIS OF RADAR SET AN/MPN-13,
(RADC TDR-64-489)
AD-614 048 DIV. 6

•BOLT BERANEK AND NEWMAN INC CAMBRIDGE MASS

• • •

ARTICULATION-TESTING METHODS: CONSONANTAL DIFFERENTIATION WITH A CLOSED-RESPONSE SET,
(ESD TDR-64-507)
AD-614 336 DIV. 5

• • •

1225
INVESTIGATION OF THE THEORY OF ALGORITHMS WITH EMPHASIS ON PROGRAM SIMPLIFICATION,
(AFCRL 65-170)
AD-614 287 DIV. 30

•BRADDOCK DUNN AND MCDONALD INC EL PASO TEX

• • •

INVESTIGATION OF THE STATISTICS OF BREAKDOWN USING NANOSECOND PULSE TECHNIQUES,
(RADC TR-64-584)
AD-614 286 DIV. 2

•BRITISH COLUMBIA UNIV (VANCOUVER)

• • •

THE EFFECT OF STRAIN ON THE EXCITON SPECTRUM OF GERMANIUM,
AD-614 200 DIV. 25

•BROOKHAVEN NATIONAL LAB UPTON N Y

• • •

DYNAMICAL MODEL OF THE 1535-MEV XI• HYPERON,
(AFOSR 65-0506)
AD-614 176 DIV. 20

•BROWN ENGINEERING CO INC HUNTSVILLE ALA RESEARCH LABS

• • •

R 139
PARTICLE GROWTH IN THE IONIC NUCLEATION CONDENSATION COLLOIDAL ION SOURCE,
AD-614 111 DIV. 27

• • •

TN R 138
TRANSIENT CHAMBER PRESSURE AND THRUST IN SOLID ROCKET MOTORS,
AD-613 962 DIV. 27

•BULOVA WATCH CO WOODSIDE N Y ELECTRONICS DIV

• • •

PRODUCTION ENGINEERING MEASURE FOR TYPE CR-(XM-60)/U CRYSTAL UNITS.
AD-614 074 DIV. 8

•BUREAU OF AIRCRAFT PRODUCTION DAYTON OHIO AIRPLANE ENGINEERING DEPT

• • •

FULL FLIGHT PERFORMANCE TESTING, PHYSICAL DATA AND TYPES OF INSTRUMENTS REQUIRED: METHODS OF CORRECTING AND RECORDING RESULTS ON STANDARD FORMS.
AD-613 955 DIV. 1

•BUREAU OF MINES PITTSBURGH PA

• • •

STRESS WAVES IN BOUNDED MEDIA.
AD-613 935 DIV. 22

•BUREAU OF NAVAL WEAPONS NAVY DEPT WASHINGTON D C

• • •

1488 V5
HANDBOOK OF SUPERSONIC AERODYNAMICS. VOLUME 5, SECTION 15. PROPERTIES OF GASES.
AD-613 972 DIV. 9

• • •

7813
CONCERNING AN INTEGRAL OCCURRING IN AEROFOIL THEORY
AD-614 139 DIV. 9

• • •

8038 P1
THEORETICAL STUDIES OF SEA ANIMAL LOCOMOTION. PART I.
AD-614 140 DIV. 9

• • •

8494 P1
THE EFFECT OF AN INTENSE MAGNETIC FIELD ON ROCKET NOZZLE HEAT TRANSFER. PART 1: THEORY AND SUPERCONDUCTING MAGNET EXPERIMENTS.
AD-613 992 DIV. 27

• • •

8539

CHAR DEPTH IN NOZZLE INSERTS,
AD-619 260 DIV. 27

• • •

8615
AN EXPERIMENTAL INVESTIGATION OF THE FLOW PHENOMENA INVOLVED IN GASEOUS THRUST DIRECTION CONTROL DEVICES.
AD-619 279 DIV. 27

• • •

8630
SILICON P-N JUNCTIONS AS AUTOMATIC GAIN CONTROL (AGC) ELEMENTS FOR VIDEO PULSES
AD-619 280 DIV. 8

• • •

8729
THE ANALYSIS OF ROUND-OFF AND TRUNCATION ERRORS OF THE CONTROLLER IN A HYBRID (DIGITAL-ANALOG) CONTROL SYSTEM
AD-619 281 DIV. 30

•CALIFORNIA INST OF TECH PASADENA

• • •

THE EFFECT OF THE 3.10 MEV STATE OF F17 ON THE O16(P, GAMMA) REACTION,
AD-619 204 DIV. 20

• • •

COULOMB EXCITATION OF TM169,
AD-619 205 DIV. 20

• • •

NEUTRINO-SPECTROSCOPY OF THE SOLAR INTERIOR,
AD-619 323 DIV. 2

•CALIFORNIA STATE COLL LONG BEACH DEPT OF CHEMISTRY

• • •

THERMODYNAMIC PROPERTIES OF AQUEOUS SOLUTIONS OF MIXED ELECTROLYTES. THE HYDROCHLORIC ACID-POTASSIUM CHLORIDE SYSTEM FROM 40 TO 0C,
(AROD 3956:4)
AD-619 558 DIV. 4

•CALIFORNIA UNIV BERKELEY

• • •

PHASE-SHIFT EQUATIONS FOR MANY-CHANNEL PROBLEMS (AFOSR 65-0493)
AD-619 167 DIV. 20

• • •

A STUDY OF THE AFTERSHOCKS AND FOCAL MECHANISM OF THE SALINAS-WATSONVILLE EARTH QUAKES OF AUGUST 31 AND SEPTEMBER 14, 1963,
AD-619 335 DIV. 2

• • •

CRUSTAL STRUCTURE IN CENTRAL CALIFORNIA IN RELATION TO THE SIERRA NEVADA,
AD-619 352 DIV. 2

• • •

EFFECT OF MAGNETIC FIELD ON THERMAL CONDUCTIVITY AND ENERGY GAP OF SUPERCONDUCTING FILMS,
AD-619 369 DIV. 25

• • •

OPTIMUM STRATIFICATION WITH TWO CHARACTERS,
(AROD 362:69)
AD-619 526 DIV. 15

•CALIFORNIA UNIV BERKELEY SCHOOL OF OPTOMETRY

• • •

TR 6
VISUAL ACUITY,
AD-619 178 DIV. 16

•CALIFORNIA UNIV LA JOLLA

• • •

TRANSITION PROBABILITY OPERATORS.
AD-619 436 DIV. 15

•CALIFORNIA UNIV LOS ANGELES

• • •

INFLUENCE OF THE GASTROINTESTINAL IODIDE CYCLE ON THE EARLY DISTRIBUTION OF RADIO ACTIVE IODIDE IN MAN,
AD-619 185 DIV. 16

• • •

GENERALIZED RATIONAL APPROXIMATION,
(AFOSR 65-0624)
AD-619 528 DIV. 15

• • •

HARMONIC FUNCTIONS WITH GIVEN VALUES AND MINIMUM NORMS IN RIEMANNIAN SPACES,
(AROD 1517:71)
AD-619 543 DIV. 15

• • •

USC GEOL 65 1
MARINE GEOLOGY AND OCEANOGRAPHY OF FLORIDA BAY, APALACHICOLA BAY AND VICINITY, FLORIDA.
AD-619 437 DIV. 2

• • •

WP 71
ON RANDOM WALKS WITH AN ABSORBING BARRIER AND GAMBLING SYSTEMS,
AD-619 064 DIV. 15

•CALIFORNIA UNIV SANTA BARBARA

• • •

TR 6
LASER POSSIBILITIES OF CHEMICALLY EXCITED MOLECULES FORMED WITH ATOMIC SPECIES
AD-619 324 DIV. 25

• • •

TR 7
INVERTED POPULATION DISTRIBUTIONS PRODUCED BY CHEMICAL REACTIONS,
AD-619 325 DIV. 25

•CAMBRIDGE LANGUAGE RESEARCH UNIT (ENGLAND)

• • •

M L 171
SEMANTIC BASIS OF COMMUNICATION.
(AFOSR 65-0513)
AD-619 093 DIV. 32

•CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION

• • •

MSRR 25
A MULTIPHASE-DUAL ALGORITHM FOR THE ZEROONE INTEGER PROGRAMMING PROBLEM.
AD-619 121 DIV. 15

•CATHOLIC UNIV OF AMERICA WASHINGTON D C

• • •

RESEARCH ON THE APPLICATION OF FERRO-AND FERRIELECTRIC PHENOMENA IN COMPUTER DEVICES.
(RADC TR-64-529)
AD-619 010 DIV. 30

•CENTER FOR DOCUMENTATION AND COMMUNICATION RESEARCH WESTERN RESERVE UNIV CLEVELAND

• • •

CSL TR 2
METHODOLOGY FOR TEST AND EVALUATION OF INFORMATION RETRIEVAL SYSTEMS
(AFOSR 65-0587)
AD-619 005 DIV. 32

•CENTRAL RADIO PROPAGATION LAB NATIONAL BUREAU OF STANDARDS BOULDER COLO

• • •

CHARGE-TRANSFER ABSORPTION SPECTRA OF NO IN KR AND CH3OH SOLUTIONS,
AD-619 552 DIV. 25

• • •

TN 225
OPTICAL SCINTILLATION: A SURVEY OF THE LITERATURE
AD-619 056 DIV. 2

•CENTRE DE PHYSIQUE ELECTRONIQUE ET CORPUSCULAIRE ORSAY (FRANCE)

• • •

WR 1218
RESEARCH ON ONE MILLIMETER C. W. CARCINOTRON.
(RADC TR-65-154)
AD-619 459 DIV. 8

• • •

WR 1344
GENERATION OF INFRAMILLIMETRIC WAVES BY MEANS OF ELECTRONIC BEAMS.
(RADC TR-65-162)
AD-619 124 DIV. 8

•CENTRE D'ETUDES DE PHYSIOLOGIE NERVEUSE ET D'ELECTROPHYSIOLOGIE PARIS (FRANCE).

• • •

EVOKED ACTIVITY IN THE CAUDATE NUCLEUS OF THE CAT IN RESPONSE TO VARIOUS KINDS OF AFFERENT STIMULI. I. MACROPHYSIOLOGICAL STUDY (ACTIVITES EVOQUEES DANS LE NOYAU CAUDE DU CHAT EN REPONSE A DES TYPES DIVERS D'AFFERENCES. I. ETUDE MACROPHYSIOLOGIQUE,
(AFOSR TN-60-1214)
AD-619 510 DIV. 16

•CHALMERS UNIV OF TECH GOTHENBURG (SWEDEN)

• • •

TN 5 RR 50
SOME FREQUENCY AND POWER CONVERSION PROPERTIES OF CYCLOTRON WAVES,
(RADC TR-65-155)
AD-619 123 DIV. 8

•CHICAGO UNIV ILL

• • •

ON THE STABILITY OF THE JACOBI ELLIPSOIDS,
(AFOSR 4612)
AD-619 156 DIV. 2

• • •

PRODUCTS BETWEEN HOMOTOPY GROUPS AND THE J-MORPHISM
(AROD 2160:16)
AD-619 137 DIV. 15

• • •

NON-RADIAL OSCILLATIONS OF GASEOUS MASSES,
AD-619 330 DIV. 2

• • •

RELATIONSHIP BETWEEN ACTIVITY OF PYRUVATE KINASE AND AGE OF THE NORMAL HUMAN ERYTHROCYTE,
AD-619 522 DIV. 16

•COATES CHEMICAL LABS LOUISIANA STATE UNIV BATON ROUGE

• • •

PHOTOCONDUCTIVITY OF ANTHRACENE,
(AROD 4706:1)
AD-619 197 DIV. 25

•COLORADO STATE UNIV FORT COLLINS

• • •

CER65EJP14
THE VELOCITY FIELD DOWNSTREAM FROM A TWODIMENSIONAL MODEL HILL. PART 1.
AD-619 067 DIV. 9

•COLORADO UNIV BOULDER

• • •

A NOTE ON THE SIGNATURES

OF THE DOMINANT REGGE TRAJECTORIES (AFOSR 65-0476)
AD-614 537 DIV. 20

•COLUMBIA UNIV NEW YORK
• • •
MAINTAINING AN ABSOLUTE HUE IN THE PRESENCE OF DIFFERENT BACKGROUND COLORS,
AD-614 199 DIV. 16
• • •
THE BISECTION OF A VISUAL EXTENT,
AD-614 238 DIV. 28
• • •
VISUAL SPACE: A TEST OF THE CONSTANT CURVATURE HYPOTHESIS,
AD-614 363 DIV. 28
• • •
DESARGUESIAN PROPERTY IN VISUAL SPACE,
AD-614 364 DIV. 28

•COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS
• • •
STUDIES ON THE ROLE OF POTASSIUM IONS IN THE LETHAL TOXICITY OF STREPTOLYSIN O
AD-614 198 DIV. 16

•COLUMBIA UNIV NEW YORK SCHOOL OF ENGINEERING AND APPLIED SCIENCE
• • •
TR 27
OPTIMAL RANDOMIZED REPLACEMENT UNDER MARKOVIAN DETERIORATION.
AD-614 120 DIV. 26

•CONNECTICUT UNIV STORRS
• • •
CHARGE-STATE CORRELATIONS IN AR(+) -AR COLLISIONS,
(AROD 2805:11)
AD-614 548 DIV. 25

•COOLEY ELECTRONICS LAB UNIV OF MICHIGAN ANN ARBOR
• • •
TR 161
THEORY OF SIGNAL DETECTABILITY: COMPOSITE DEFERRED DECISION THEORY.
AD-614 480 DIV. 8
• • •
03674 5 T
THEORY OF SIGNAL DETECTABILITY: COMPOSITE DEFERRED DECISION THEORY.
AD-614 480 DIV. 8

•CORNELL AERONAUTICAL LAB INC BUFFALO N Y
• • •
TECHNIQUES FOR SOLVING NONEQUILIBRIUM EXPANDING FLOW PROBLEMS.
(ARL 65-2)
AD-614 457 DIV. 9

•CORNELL UNIV ITHACA N Y
• • •
AN ESTIMATION LEMMA FOR LAMINAR COMPRESSIBLE BOUNDARY-LAYER VELOCITY PROFILES.
AD-614 159 DIV. 9
• • •
ANOMALOUS NUCLEAR MAGNETIC RESONANCE LINEWIDTH IN LITHIUM
AD-614 369 DIV. 25
• • •
ESR MEASUREMENT OF SPIN SUSCEPTIBILITY OF GRAPHITE IN A LOW MAGNETIC FIELD,
AD-614 366 DIV. 20
• • •
VIBRATIONAL EXCITATION IN SOME FOUR-CENTER TRANSITION STATES,
AD-614 548 DIV. 4
• • •
TR 1 MSC 322
EXCITON ABSORPTION IN THE PRESENCE OF EXCITED F-CENTERS,
AD-614 487 DIV. 25
• • •
TR 4
GROUND STATE OF AN ELECTRON GAS IN A MAGNETIC FIELD,
AD-614 254 DIV. 25
• • •
TR 7
PHOTOIONIZATION CROSS SECTION OF HELIUM IN THE 100- TO 250-A REGION,
(AROD 2810:7)
AD-614 533 DIV. 25

•CRUFT LAB HARVARD UNIV CAMBRIDGE MASS
• • •
VERY LOW FREQUENCY PROPAGATION; ELECTRON AND SOLID STATE PHYSICS; AUTOMATIC CONTROL; COMMUNICATIONS AND NETWORKS; ELECTROMAGNETIC RADIATION.
AD-614 130 DIV. 30

•CRYOGENIC ENGINEERING LAB MASS INST OF TECH CAMBRIDGE
• • •
THE PRODUCTION OF INTENSE MAGNETIC FIELDS BY MEANS OF LIQUID NITROGEN COOLED COPPER COILS.
(AFCRL 65-1)
AD-613 967 DIV. 25

•CRYSTAL RESEARCH LAB PENNSYLVANIA STATE UNIV UNIVERSITY PARK
• • •
RESEARCH, DEVELOPMENT AND APPLICATIONS OF X-RAC, S-FAC AND R-PAC, ELECTRONIC ANALOGUE COMPUTERS FOR X-RAY CRYSTAL ANALYSIS.
AD-613 925 DIV. 30

•CTS KNIGHTS INC SANDWICH ILL
• • •
HIGH PRECISION 5 MC QUARTZ RESONATORS FOR TEMPERATURE CONTROL BETWEEN 20 AND 30 C.
AD-614 433 DIV. 8
• • •
HIGH PRECISION 5 MC QUARTZ RESONATORS FOR TEMPERATURE CONTROL BETWEEN 20 AND 30C.
AD-614 434 DIV. 8

•DARTMOUTH COLL HANOVER N H
• • •
SEMANTIC COMPONENTS OF THE QUALITY OF PROCESSED SPEECH
AD-614 147 DIV. 28

•DATA-DESIGN LABS ONTARIO CALIF
• • •
DEVELOPMENT OF TEST ITEMS FOR OFFICER SELECTION AND CLASSIFICATION BATTERIES.
AD-614 224 DIV. 23

•DAVID TAYLOR MODEL BASIN WASHINGTON D C
• • •
1307
ON THE DESIGN OF A RESISTANCE-CAPACITANCE FILTER FOR USE AT VERY LOW FREQUENCIES,
AD-613 947 DIV. 8
• • •
1358
FREE-RUNNING MODEL TECHNIQUES FOR THE EVALUATION OF SHIP-HANDLING QUALITIES,
AD-614 114 DIV. 31
• • •
1377
THE DTMB TYPE 377-1A ELECTRONIC LOW-PASS FILTER INSTRUCTION MANUAL,
AD-613 948 DIV. 8
• • •
1877
STRUCTURAL AND MACHINERY VIBRATIONS OF HYDROFOIL SHIPS
AD-614 028 DIV. 31
• • •
1987
MATERIALS SURVEY FOR THE RESCUE AND SEARCH VEHICLES OF THE DEEP-SUBMERGENCE SYSTEMS PROJECT,
AD-614 421 DIV. 31

•DECISION SCIENCES LAB BEDFORD MASS
• • •
IDENTIFICATION OF ELEMENTARY AUDITORY DISPLAYS: EFFECT OF UNBALANCED PROBABILITIES OF OCCURRENCE,
(ESD TDR-63-352)
AD-614 297 DIV. 8

•DEFENSE METALS INFORMATION CENTER COLUMBUS OHIO
• • •
DMIC M 202
STRESS-CORROSION CRACKING OF ALUMINUM ALLOYS,
AD-613 957 DIV. 17

•DELAWARE UNIV NEWARK DEPT OF PHYSICS
• • •
ELECTRO-OPTICAL METHOD FOR INVESTIGATION OF FIELD AND CURRENT DISTRIBUTIONS IN SEMICONDUCTORS AND LAYER-LIKE FIELD DISTRIBUTIONS IN PHOTOCONDUCTORS.
AD-614 439 DIV. 25

•DELCO-REMY DIV GENERAL MOTORS CORP ANDERSON IND
• • •
ZINC ELECTRODE INVESTIGATION.
AD-614 119 DIV. 7

•DENVER UNIV COLO DEPT OF GEOGRAPHY
• • •
65 1 DRI 2214
TRINCHERAS AND PHYSICAL ENVIRONMENT ALONG THE RIO GAVILAN, CHIHUAHUA, MEXICO.
AD-614 441 DIV. 2

•DEPARTMENT OF DEFENSE WASHINGTON D C
• • •
PROPERTIES OF STRIP TRANSMISSION LINE, VOLUME I.
AD-614 035 DIV. 8
• • •
PROPERTIES OF STRIP TRANSMISSION LINE, VOLUME II.
AD-614 036 DIV. 8

•DEPARTMENT OF JUSTICE WASHINGTON D C
• • •
REPORT OF THE ATTORNEY GENERAL, PURSUANT TO SECTION 10(C) OF THE SMALL BUSINESS ACT OF 1958 AS AMENDED,
AD-614 474 DIV. 18

•DOUGLAS AIRCRAFT CO INC SANTA MONICA CALIF
• • •
1738
CAVITY NUCLEAR REACTORS
AD-613 998 DIV. 21

•DUKE UNIV DURHAM N C
• • •

BEAMS OF HELIUM ATOMS AT TEMPERATURES BELOW 0.9 K,
AD-614 373 DIV. 25

• • •

DENSITY OF LIQUID HELIUM-3 BETWEEN 0.045 AND 1.3K,
AD-614 376 DIV. 4

• • •

RING METALATION OF DIMETHYLAMINOMETHYLFERROCENE WITH BUTYLLITHIUM AND CONDENSATIONS WITH ELECTROPHILIC COMPOUNDS. SYNTHESIS OF 1,2-DISUBSTITUTED FERROCENES,
(AROD 3581:7)
AD-614 544 DIV. 4

•DUMONT (ALLEN B) LABS DIV FAIRCHILD CAMERA AND INSTRUMENT CORP CLIFTON N J

• • •

MO 10159 REV. 1
12 INCH DIAMETER CATHODE RAY TUBE WITH FIBER OPTIC FACEPLATE.
AD-614 448 DIV. 8

• • •

SI 5874 REV. 1
12 INCH DIAMETER CATHODE RAY TUBE WITH FIBER OPTIC FACEPLATE.
AD-614 448 DIV. 8

•EATON ELECTRONICS RESEARCH LAB MCGILL UNIV MONTREAL (QUEBEC)

• • •

CALCULATION OF CRYSTAL-FIELD ENERGY-LEVEL SPLITTINGS OF THE TI(3+) ION IN RBAl(SO4) 2.12H2O,
AD-614 357 DIV. 25

•EDINBURGH UNIV (SCOTLAND)

• • •

SMOOTH MUSCLE RESPONSES AS ALTERED BY HUMORAL BACKGROUND.
(AFOSR 65-0664)
AD-614 478 DIV. 16

•EITEL-MCCULLOUGH INC SAN CARLOS CALIF

• • •

HIGH POWER X-BAND GENERATOR.
(RADC TDR-65-96)
AD-614 001 DIV. 8

•ELECTRICAL ENGINEERING RESEARCH LAB UNIV OF ILLINOIS URBANA

• • •

STUDIES IN QUANTUM AND SOLID STATE ELECTRONICS.
(AFOSR 65-0661)
AD-614 007 DIV. 25

• • •

MILLIMETER WAVE GENERATION BY MULTIPLE QUANTUM CONVERSION.

(AFOSR 65-044)
AD-614 092 DIV. 8

• • •

THE EFFECT OF ULTRASOUND ON BIOLOGICAL TISSUE.
AD-614 370 DIV. 16

•ELECTRON PHYSICS LAB UNIV OF MICHIGAN ANN ARBOR

• • •

TR 81
VELOCITY TAPERING IN MICROWAVE AMPLIFIERS.
(RADC TR-64-554)
AD-614 244 DIV. 8

•ELECTRONIC SYSTEMS DIV AIR FORCE SYSTEMS COMMAND BEDFORD MASS

• • •

TDR-63-352
IDENTIFICATION OF ELEMENTARY AUDITORY DISPLAYS: EFFECT OF UNBALANCED PROBABILITIES OF OCCURRENCE,
AD-614 297 DIV. 8

• • •

TDR-64-507
ARTICULATION-TESTING METHODS: CONSONANTAL DIFFERENTIATION WITH A CLOSED-RESPONSE SET,
AD-614 336 DIV. 5

• • •

TDR-64-564
DIGITAL COMMUNICATION OVER FIXED TIMECONTINUOUS CHANNELS WITH MEMORY, WITH SPECIAL APPLICATION TO TELEPHONE CHANNELS,
AD-614 110 DIV. 8

• • •

TDR-64-590
EFFECTS OF GENERAL RELATIVITY ON INTERPLANETARY TIME-DELAY MEASUREMENTS,
AD-614 232 DIV. 25

• • •

TDR-64-601
HUMAN PROCESSING OF EQUIVOCAL INFORMATION.
AD-613 949 DIV. 28

• • •

TDR-65-29
MEASUREMENT OF PROPERTIES OF SPREAD CHANNELS BY THE TWO-FREQUENCY METHOD WITH APPLICATION TO RADAR ASTRONOMY
AD-614 233 DIV. 2

• • •

TDR-65-31
SOLID STATE RESEARCH.
AD-613 961 DIV. 25

• • •

TDR-65-43
CALIBRATION OF A PRESSURE SENSOR FOR MEASUREMENTS IN CONTINUUM AND RAREFIED GAS FLOWS,
AD-614 424 DIV. 30

• • •

TDR-65-59
SIGNAL DISTORTION IN A FREQUENCY DIVIDER,
AD-614 425 DIV. 8

• • •

TDR-65-63
MEASUREMENTS ON AN L-BAND POWER AMPLIFIER FOR PHASED ARRAYS,
AD-614 426 DIV. 8

• • •

TR 65 193
THE ELECTRONIC SYSTEMS DIVISION. RELIABILITY/MAINTAINABILITY PROGRAM ELEMENTS,
AD-614 423 DIV. 18

• • •

TR-65-80
AN EFFICIENCY FUNCTION FOR RATING MECHANICAL SCAN-TRACK RADARS,
AD-614 477 DIV. 6

•ELECTRONICS RESEARCH LAB UNIV OF CALIFORNIA BERKELEY

• • •

CONSISTENT ESTIMATES AND ZERO-ONE SETS.
(AROD 362:66)
AD-613 917 DIV. 15

• • •

ANALYSIS AND SYNTHESIS OF STABLE LINEAR SEQUENTIAL CIRCUITS,
(AFOSR 65-0630)
AD-614 164 DIV. 30

•ELECTRO-DYNAMICS LABS UTAH STATE UNIV LOGAN

• • •

SR 3
RESTORATION OF OPTICAL PATTERNS,
(AFCRL 65-181)
AD-614 272 DIV. 30

•ENGINEERING PSYCHOLOGY LAB UNIV OF MICHIGAN ANN ARBOR

• • •

3780 23 F
HUMAN PROCESSING OF EQUIVOCAL INFORMATION.
(ESD TDR-64-601)
AD-613 949 DIV. 28

•ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL

• • •

DISCUSSION OF PAPER BY E. J. STEGELMANN AND C. H. VON KENSCHITZKI, 'ON THE INTERPRETATION OF THE SUDDEN COMMENCEMENT OF GEOMAGNETIC STORMS'
(AFOSR 65-0509)
AD-614 168 DIV. 2

• • •

A DETERMINATION OF THE SPIN OF LITHIUM 8 HYPERNUCLEUS
(AFOSR 65-0464)
AD-614 187 DIV. 20

• • •

ABSORPTION OF SIGMA(-) HYPERONS IN PHOTOGRAPHIC EMULSION NUCLEI,
(AFOSR 65-0463)
AD-614 213 DIV. 20

• • •

SOLAR FLARE HIGH ENERGY ALPHA PARTICLES AND THEIR STORAGE IN INTERPLANETARY SPACE,
(AFOSR 65-0468)
AD-614 217 DIV. 2

• • •

SOME POSSIBILITIES FOR UNUSUAL LIGHT HYPERNUCLEI
(AFOSR 65-0471)
AD-614 539 DIV. 20

•FAIRCHILD SEMICONDUCTOR RESEARCH AND DEVELOPMENT LABS PALO ALTO CALIF

• • •

MICROWAVE SOLID-STATE GENERATORS.
AD-614 047 DIV. 8

•FEDERAL SCIENTIFIC CORP NEW YORK

• • •

EXPERIMENTAL VERIFICATION OF STAR IDENTIFICATION BY OPTICAL RADIATION ANALYSIS.
(AL TDR-64-251)
AD-614 238 DIV. 19

•FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY WASHINGTON D C

• • •

PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON COLD ACCLIMATION HELD AT INSTITUTO ANTARTICO ARGENTINO, BUENOS AIRES, AUGUST 5-7, 1959.
(AFOSR 386)
AD-614 146 DIV. 16

•FIRESTONE FLIGHT SCIENCES LAB CALIF INST OF TECH PASADENA

• • •

SOLID ROCKET STRUCTURAL INTEGRITY ABSTRACTS. VOLUME II, NO. 2,
AD-614 484 DIV. 10

•FLORIDA STATE UNIV TALLAHASSEE

• • •

ARYL BORON FREE RADICALS
(AROD 3605:1)
AD-614 547 DIV. 4

•FLUID DYNAMICS RESEARCH LAB MASS INST OF TECH CAMBRIDGE

• • •

65 1
MOLECULAR BEAM VELOCITY DISTRIBUTION MEASUREMENTS
(AFOSR 65-0192)
AD-614 230 DIV. 9

*FOOD MACHINERY AND CHEMICAL CORP PRINCETON N J

• • •

PCR 297
QM ELASTOMER CONTRACT.
AD-613 945 DIV. 4

*FOREIGN TECH DIV AIR FORCE SYSTEMS COMMAND WRIGHT-PATTERSON AFB OHIO

• • •

FTD MT 63 339
CLIMATE OF THE FREE ATMOSPHERE,
(TT 65-61986)
AD-613 988 DIV. 2

• • •

FTD MT 64 293
CALCULATION OF CHARGES DURING MASSIVE EXPLOSIONS FOR THROWING-OUT, 2 ED. REV
(TT 65-61985)
AD-613 987 DIV. 13

• • •

FTD MT 64 60
RADIO AND RADAR TECHNOLOGY AND ITS APPLICATION,
(TT 65-61976)
AD-613 964 DIV. 5

• • •

FTD TT 64 1030
SPEED OF SOUND IN TWO-PHASE MEDIA,
(TT 65-61987)
AD-614 015 DIV. 25

• • •

FTD TT 64 1032
EXPERIMENTAL PROGNOSES OF AIRCRAFT BUMPINESS BY A DEFINED RICHARDSON CRITERION
(TT 65-61988)
AD-614 016 DIV. 1

• • •

FTD TT 64 1037
INVESTIGATING OXIDATIONS OF NIOBIUMTITANIUM-ZIRCONIUM ALLOYS,
(TT 65-61989)
AD-614 017 DIV. 17

• • •

FTD TT 64 1038
ON THE PROPAGATION OF A SHOCK WAVE IN THE GROUND DURING IMPACT OF A VERY FAST METEORITE AGAINST THE SURFACE OF THE PLANET,
(TT 65-61990)
AD-614 018 DIV. 2

• • •

FTD TT 64 1039
FORMULATION OF TRAJECTORIES OF AIR PARTICLES WITH THE AID OF ELECTRONIC COMPUTERS
(TT 65-61993)
AD-614 021 DIV. 2

• • •

FTD TT 64 1043
THERMOANEMOMETER WITH DC FEEDBACK,
(TT 65-61992)
AD-614 020 DIV. 30

• • •

FTD TT 64 1046
STUDYING MECHANICAL AND THERMAL FATIGUE OF METALS BY THE INTERNAL FRICTION METHOD
(TT 65-61991)
AD-614 019 DIV. 17

• • •

FTD TT 64 1056
X-RAY EXAMINATION OF THE ORDERING PROCESS IN ALLOYS
(TT 65-62063)
AD-614 387 DIV. 17

• • •

FTD TT 64 1057
CURRENT FROM ALCOHOL
(TT 65-62064)
AD-614 388 DIV. 7

• • •

FTD TT 64 1064
USE OF SHADOWGRAPH MEASUREMENTS FOR QUALITATIVE RESEARCH OF A SUPERSONIC FLOW AROUND A WING PROFILE,
(TT 65-62065)
AD-614 389 DIV. 9

• • •

FTD TT 64 1285
A SELF-ADJUSTING SYSTEM
(TT 65-61994)
AD-614 022 DIV. 30

• • •

FTD TT 64 1326
'EARTHLY SUN' OBEY.
(TT 65-61995)
AD-614 023 DIV. 20

• • •

FTD TT 64 1363
SUBTERRANEAN LIGHT,
(TT 65-61996)
AD-614 024 DIV. 16

• • •

FTD TT 64 1372
MARVELOUS ORBIT,
(TT 65-61997)
AD-614 025 DIV. 32

• • •

FTD TT 65 135
ULTRASONIC FLAW DETECTOR
(TT 65-62073)
AD-614 397 DIV. 30

• • •

FTD TT 65 16
STABILITY OF A FLAT LAYER OF IDEALLYCONDUCTING VISCOUS FLUID IN A LONGITUDINAL MAGNETIC FIELD,
(TT 65-62001)
AD-614 026 DIV. 25

• • •

FTD TT 65 220
HIGH-SPEED COLOR PHOTOGRAPHY OF SELFLUMINOUS PROCESSES
(TT 65-62074)
AD-614 398 DIV. 24

• • •

FTD TT 65 246
CALIBRATION OF SURVEY CAMERAS ON THE BASIS OF MODEL DEFORMATIONS,
(TT 65-62075)
AD-614 399 DIV. 2

• • •

FTD TT 65 249
COMMENTS ON THE EFFECT OF A DEFORMED, PLANE PARALLEL GLASS PLATE IN THE IMAGE PLANE OF AN OBJECTIVE ON ITS DISTORTION
(TT 65-62057)
AD-614 401 DIV. 2

• • •

FTD TT 65 263
INVESTIGATIONS OF RADIATIONS ON MAN-MADE EARTH SATELLITE COSMOS-17,
(TT 65-62058)
AD-614 402 DIV. 12

• • •

FTD TT 65 37
NEW 5KHGSVF FORGING STEEL
(TT 65-62066)
AD-614 390 DIV. 17

• • •

FTD TT 65 388
THE INFLUENCE OF CERTAIN PHARMACOLOGICAL PREPARATIONS ON THE BIOELECTRIC ACTIVITY OF THE BRAIN IN SCHIZOPHRENIA
(TT 65-62060)
AD-614 403 DIV. 16

• • •

FTD TT 65 389
BIOLOGICAL WEAPONS,
(TT 65-62061)
AD-614 404 DIV. 3

• • •

FTD TT 65 390
SETTLING-OUT OF COBALT FROM LEAN SOLUTIONS WITH SODIUM SULFIDE,
(TT 65-62059)
AD-614 405 DIV. 17

• • •

FTD TT 65 49
THE BOUNDARY LAYER ON A FLAT PLATE IN ANISOTROPIC MAGNETOHYDRODYNAMICS,
(TT 65-62067)
AD-614 391 DIV. 25

• • •

FTD TT 65 68
CHEMICAL WEAPONS,
(TT 65-62068)
AD-614 392 DIV. 3

• • •

FTD TT 65 71
OBTAINING INTENSIVE MOLECULAR BEAM,
(TT 65-62069)
AD-614 393 DIV. 30

• • •

FTD TT 65 72
COSMIC HORIZONS OF ANABIOSIS
(TT 65-62070)
AD-614 394 DIV. 16

• • •

FTD TT 65 90
EXPERIMENTS IN TELEVISION PHOTOGRAPHY OF THE MOON IN THE 0.8-1.1 AND 0.8-2.3 MICRON RANGE,
(TT 65-62071)
AD-614 395 DIV. 2

• • •

FTD TT 65 96
APPROXIMATE ENZYMIC METHOD OF MICROANALYSIS FOR IDENTIFYING RESIDUAL AMOUNTS OF ORGANO PHOSPHORUS INSECTICIDES,
(TT 65-62072)
AD-614 396 DIV. 4

*FOREST SERVICE WASHINGTON D C

• • •

RR 10
PROBABILITY OF EFFECTIVE POST-ATTACK FIRE FIGHTING IN WILDLANDS,
AD-614 488 DIV. 13

*FRANKFORD ARSENAL PHILADELPHIA PA RESEARCH AND DEVELOPMENT DIRECTORATE

• • •

A64 29
SILICON AND ZINC EFFECT ON MAGNESIUM-LITHIUM AND MAGNESIUM-LITHIUM-SILVER ALLOYS.
AD-614 422 DIV. 17

*FRANKLIN INST PHILADELPHIA PA

• • •

DIFFUSION IN ORGANIC CRYSTALS. I. SELFDIFFUSION IN ANTHRACENE,
(AROD 4168:2)
AD-614 531 DIV. 25

*GENERAL DYNAMICS FORT WORTH TEX

• • •

FZK 197
A CONSISTENT-VIBRATIONS MODEL OF THE INTERNAL DYNAMICS OF LIQUID HYDROGEN.
(WL TR-64-162)
AD-614 039 DIV. 25

• • •

FZK 199
COLD-NEUTRON SCATTERING CROSS SECTION OF LIQUID HYDROGEN BASED ON A CONSISTENTVIBRATIONS LIQUID MODEL.
(WL TR-64-161)
AD-614 038 DIV. 25

• • •

FZK 208

DEVELOPMENT AND APPLICATION OF NUCLEAR MEASUREMENT TECHNIQUES. (WL TR-64-160)
AD-614 109 DIV. 16

• • •

FZK 211
COMPUTER CODES FOR REACTOR AND HAZARD ANALYSES AT NARF. (WL TR-64-138)
AD-613 983 DIV. 20

• • •

FZK 215
REACTOR INSTRUMENTATION RESPONSE TO INCORE VOID FORMATION. (WL TR-64-145)
AD-614 037 DIV. 20

•GENERAL DYNAMICS/FORT WORTH TEX NUCLEAR AEROSPACE RESEARCH FACILITY

• • •

FZK 201
FORMULATION OF RADIATION TRANSPORT SOLUTIONS FOR SHIELDING APPLICATIONS, INCLUDING INTEGRAL TRANSFORM METHODS, MATRIX TECHNIQUES, AND ASYMPTOTIC APPROXIMATIONS. (WL TR-64-151)
AD-614 250 DIV. 20

• • •

FZK 207
FIRST TEST ON RADIATION EXPERIMENTATION FOR THE G-FACTOR TECHNIQUE. (WL TR-64-146)
AD-614 112 DIV. 8

• • •

FZK 209
AN INVESTIGATION OF THE THERMAL RESPONSE OF THE AEROSPACE SHIELD TEST REACTOR TO LOSS OF COOLANT. (WL TR-64-137)
AD-614 492 DIV. 20

• • •

FZK 210
THE INTERACTIONS OF 14.6-MEV NEUTRONS IN IRON, LITHIUM-7, AND CARBON. (WL TR-64-140)
AD-614 451 DIV. 20

•GENERAL ELECTRIC CO SCHENECTADY N Y

• • •

ULTRA HIGH POWER TRANSMISSION LINE TECHNIQUES. (RADC TR-65-7)
AD-613 953 DIV. 8

•GEOLOGICAL SURVEY DENVER COLO

• • •

TL 33
THE BASALT-ECLOGITE TRANSFORMATION AND CRUSTAL STRUCTURE IN THE WESTERN UNITED STATES.
AD-614 303 DIV. 2

•GEOPHYSICS CORP OF AMERICA BEDFORD MASS

• • •

GCA TR 64 13 A
MODEL ATMOSPHERES DETERMINED BY ABSORPTION OF SOLAR RADIATION (AFCRL 64-874)
AD-614 088 DIV. 2

• • •

SR 6
MODEL ATMOSPHERES DETERMINED BY ABSORPTION OF SOLAR RADIATION (AFCRL 64-874)
AD-614 089 DIV. 2

•GEORGE WASHINGTON UNIV WASHINGTON D C SCHOOL OF ENGINEERING AND APPLIED SCIENCE

• • •

STUDIES IN THE THEORY OF A DISLOCATED CONTINUUM.
AD-614 229 DIV. 25

•GRADUATE AERONAUTICAL LABS CALIF INST OF TECH PASADENA

• • •

END-WALL HEAT-TRANSFER EFFECTS ON THE TRAJECTORY OF A REFLECTED SHOCK WAVE
AD-614 378 DIV. 25

•GROUND ELECTRONICS ENGINEERING INSTALLATION AGENCY GRIFFISS AFB N Y

• • •

GEEIA TR 65 1
ANTENNA WIRE SAG AND TENSION CALCULATIONS,
AD-614 075 DIV. 8

•GROUP FOR THE ADVANCEMENT OF SPECTROSCOPIC METHODS PARIS (FRANCE)

• • •

RESEARCH ON BASIC FAR-INFRARED TECHNIQUES. (AFCRL 65-204)
AD-613 966 DIV. 20

•GRUMMAN AIRCRAFT ENGINEERING CORP BETHPAGE N Y

• • •

A CONICAL THIN-SHOCK-LAYER THEORY UNIFORMLY VALID IN THE ENTROPY LAYER, (FDL TDR-64-82)
AD-614 444 DIV. 9

•HARRY DIAMOND LABS WASHINGTON D C

• • •

TR 1267
MEASUREMENT OF ELECTROSTATIC CHARGE ON AIRCRAFT,
AD-614 060 DIV. 1

•HARVARD COLL CAMBRIDGE MASS OBSERVATORY

• • •

COMPARISON BETWEEN MODEL ATMOSPHERES AND SPECTRA FROM EARLY-TYPE STARS,
AD-614 523 DIV. 2

•HARVARD UNIV CAMBRIDGE MASS

• • •

CODING AND TRANSMISSION IN THE VISUAL SYSTEM. (AFOSR 65-0458)
AD-614 486 DIV. 16

•HARVARD UNIV CAMBRIDGE MASS DIV OF ENGINEERING AND APPLIED PHYSICS

• • •

THE VISCOUS INCOMPRESSIBLE FLOW INSIDE A CONE, (AFOSR 65-0597)
AD-614 492 DIV. 9

•HAWAII INST OF GEOPHYSICS HONOLULU

• • •

HIG 65 5
A PROGRAM FOR ROUTINE LOCATION OF TPHASE SOURCES IN THE PACIFIC.
AD-614 273 DIV. 2

•HIGH ENERGY PHYSICS LAB STANFORD UNIV CALIF

• • •

HEPL 355
ELECTRON SCATTERING ON NUCLEONS, THREEBODY NUCLEI, AND CA40,
AD-614 270 DIV. 20

• • •

HEPL 356
PHOTODISINTEGRATION OF THE DEUTERON BY POLARIZED PHOTONS,
AD-614 276 DIV. 20

•HONEYWELL RESEARCH CENTER HOPKINS MINN

• • •

FABRICATION AND FRACTURE OF POLYCRYSTALLINE NIO. (AROD 2884:31)
AD-614 263 DIV. 14

• • •

MECHANICAL BEHAVIOR OF POLYCRYSTALLINE CERAMICS. (AROD 2884:4)
AD-614 265 DIV. 14

• • •

TR 28 HR 65 256
MECHANICAL PROPERTIES OF POLYCRYSTALLINE SODIUM CHLORIDE,
AD-614 054 DIV. 25

•HUGHES AIRCRAFT CO CULVER CITY CALIF

• • •

CONTINUOUSLY PULSED LASER DEVICE FOR SURVEILLANCE.
AD-614 445 DIV. 25

•HUGHES AIRCRAFT CO NEWPORT BEACH CALIF

• • •

MOLECULAR BANDPASS AMPLIFIERS.
AD-614 468 DIV. 8

•HYDRODYNAMICS LAB CALIF INST OF TECH PASADENA

• • •

E 111.9
A CLASS OF MULTIPLE INTEGRALS OF THE STATIONARY PHASE TYPE OCCURRING IN THE THEORY OF WATER WAVES,
AD-613 973 DIV. 9

•ILLINOIS UNIV URBANA

• • •

A STUDY OF THE BEHAVIOR OF SOIL AND ROCK SUBJECTED TO HIGH STRESS LEVELS. (WL TR-64-157)
AD-614 481 DIV. 13

•ILLINOIS UNIV URBANA DEPT OF PHYSICS

• • •

FERROMAGNETISM IN THE TRANSITION METALS,
AD-613 977 DIV. 25

• • •

GREEN'S FUNCTIONS AND SUPERFLUID HYDRODYNAMICS,
AD-614 044 DIV. 25

• • •

CALCULATION OF THE QUASIP ARTICLE RECOMBINATION TIME IN A SUPERCONDUCTOR,
AD-614 267 DIV. 25

• • •

DETERMINATION OF RECOILLESS FRACTIONS FROM MOSSBAUER SCATTERING,
AD-614 268 DIV. 20

•ILLINOIS UNIV URBANA ENGINEERING EXPERIMENT STATION

• • •

COGNITRON THEORY, (AFOSR 65-0582)
AD-614 006 DIV. 30

•IMPERIAL COLL OF SCIENCE AND TECH LONDON (ENGLAND)

• • •

ON MASSIVE AND MASSLESS PHOTONS, (AFOSR 65-0479)
AD-614 184 DIV. 25

• • •

PRACTICLE THEORY OF THREE-PARTICLE STATES. I. NONRELATIVISTIC, (AFOSR 65-0462)
AD-614 493 DIV. 20

•INDIANA UNIV BLOOMINGTON
• • •
ELECTROPHYSIOLOGICAL EFFECTS OF THE INTERACTION BETWEEN TASK DEMANDS AND SENSORY INPUT,
AD-614 532 DIV. 28

•INDIANA UNIV BLOOMINGTON DEPT OF CHEMISTRY
• • •
COMPARISON OF THE PEPTIDE MAPS OF ANTI= BODIES AGAINST AN ACIDIC AND A BASIC DETER MINANT GROUP,
AD-614 218 DIV. 16
• • •
PEPTIDE MAPS OF ANTIBODIES AGAINST AN ANTIGEN CONTAINING TWO DIFFERENT DETERMINANT GROUPS.
AD-614 313 DIV. 16
• • •
SOME STUDIES ON THE SPECI FICITY OF AMINO ACID ENTRY ROUTES IN PIGEON ERYTHROCYTES
AD-614 314 DIV. 16
• • •
AUTO-AND CROSS-CORRELATION FUNCTIONS USED AS TOOLS FOR INFORMATION RETRIEVAL IN ELECTRON DIFFRACTION STRUCTURE STUDIES (AFOSR 65-0682)
AD-614 534 DIV. 25

•INNSBRUCK UNIV (AUSTRIA)
• • •
SR 10
INTERPRETATION OF MAGNETO GASDYNAMIC FLOW PATTERNS, (NP 14785)
AD-614 050 DIV. 25
• • •
SR 11
SOME PRACTICAL EXAMPLES OF ONE DIMENSIONAL UNSTEADY POTENTIAL FLOWS IN MGD. (NP 14789)
AD-614 052 DIV. 25
• • •
SR 13
SHOCK WAVES. (NP 14787)
AD-614 053 DIV. 25
• • •
SR 8
APPLICATION OF VARIATIONAL METHODS FOR THE SOLUTION OF GASDYNAMIC AND MAGNETOGASDYNAMIC PROBLEMS. (NP 14784)
AD-614 051 DIV. 25
• • •
SSR 9
THE HISTORICAL DEVELOPMENT OF THE SPINOR THEORY IN THE RIEMANNIAN GEOMETRY (SURVEY ON THE PUBLISHED LITERATURE)
AD-614 049 DIV. 25

•INSTITUTE FOR FLUID DYNAMICS AND APPLIED MATHEMATICS UNIV OF MARYLAND COLLEGE
• • •
EQUIVALENCE OF CERTAIN INEQUALITIES COMPLEMENTING THOSE OF CAUCHY-SCHWARZ AND HOLDER, (AFOSR 65-0602)
AD-614 158 DIV. 15

•INSTITUTE FOR MATHEMATICAL STUDIES IN TH
• • •
TR 122
THEORY OF GROWTH: REMODELLING AND REFINEMENTS,
AD-614 252 DIV. 32

•INSTITUTE FOR RESEARCH IN VISION OHIO ST
• • •
5
INFORMATION PROCESSING IN THE FROG'S RETINA. (AMRL TR-65-24)
AD-614 249 DIV. 16

•INSTITUTE FOR THE STUDY OF METALS UNIV OF CHICAGO ILL
• • •
GUEST-HOST INTERACTIONS: AN EXAMINATION OF THE SOLVENT-INDUCED SPECTRAL SHIFT IN A MODEL SYSTEM, (AFOSR 65-0939)
AD-614 289 DIV. 25

•INSTITUTE FOR THE STUDY OF RATE PROCESSES UNIV OF UTAH SALT LAKE CITY
• • •
REACTION KINETICS, THE THEORY OF LIQUIDS, AND OPTICAL ROTATION.
AD-614 083 DIV. 4

•INSTITUTE OF SCIENCE AND TECH UNIV OF MICHIGAN ANN ARBOR
• • •
4864 9 X
PROCEEDINGS OF THE SYMPOSIUM ON REMOTE SENSING OF ENVIRONMENT (3RD), 14-16 OCTOBER 1964.
AD-614 032 DIV. 30

•INTERNATIONAL RECTIFIER CORP LOS ANGELES CALIF
• • •
PRODUCTION ENGINEERING MEASURE. HIGH VOLTAGE SILICON RECTIFIER STACKS.
AD-614 446 DIV. 8

•IOWA STATE UNIV IOWA CITY
• • •
65 7
AN INTERPLANETARY DIFFUSION MODEL FOR THE TIME BEHAVIOR OF INTENSITY IN A SOLAR COSMIC RAY EVENT,
AD-614 100 DIV. 2
• • •
65 8
GEOGRAPHIC CHARTS AND ALTITUDE PLOTS FOR SELECTED VALUES OF GEOMAGNETIC SHELL PARAMETERS B AND L,
AD-614 101 DIV. 2

•ISOMET CORP PALISADES PARK N J
• • •
DEVELOPMENT OF A CARBON DIOXIDE PARTIAL PRESSURE SENSOR. (AMRL TR-64-140)
AD-614 226 DIV. 16

•JAMES FORRESTAL RESEARCH CENTER PRINCETON UNIV N J
• • •
FLD 11
EXPERIMENTS ON THE LIFT AND DRAG OF SPHERES SUSPENDED IN A LOW REYNOLDS NO. POISEUILLE FLOW,
AD-613 939 DIV. 9

•JOHNS HOPKINS UNIV BALTIMORE MD
• • •
THE TRANSIT SYSTEM,
AD-614 162 DIV. 19
• • •
SCATTERING MATRIX APPROACH TO THE LAMBDA HYPERON-PION RESONANCE,
AD-614 374 DIV. 20

•KAMAN AIRCRAFT CORP BLOOMFIELD CONN
• • •
DEVELOPMENT OF A CRASHWORTHY, ARMORED, UNIVERSAL CREW SEAT FOR U. S. ARMY AIRCRAFT. (TRECOM TR-65-2)
AD-614 231 DIV. 1

•KANSAS STATE UNIV MANHATTAN
• • •
NONBENZENOID AROMATIC SYSTEMS. I. SYNTHESIS OF 1-VINYLAZULENE AND CERTAIN SUBSTITUTED 1-VINYLAZULENES (AFOSR 65-0537)
AD-614 491 DIV. 4

•KANSAS UNIV LAWRENCE DEPT OF CHEMISTRY
• • •
CORRELATION OF SOLVENT EFFECTS ON ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF THE NITRO BENZENE ANION RADICAL, (AFOSR 65-0525)
AD-613 924 DIV. 4
• • •
OPERATIONAL AMPLIFIER CIRCUITS FOR CONTROLLED POTENTIAL CYCLIC VOLTAMMETRY, II, (AFOSR 65-0527)
AD-614 195 DIV. 4
• • •
VOLTAMMETRY AND ELECTRON PARAMAGNETIC RESONANCE SPECTRA OF HALONITROBENZENE ANION RADICALS, (AFOSR 65-0524)
AD-614 291 DIV. 4
• • •
APPLICATION OF ELECTRON PARAMAGNETIC RESONANCE TECHNIQUES IN ELECTROCHEMISTRY, (AFOSR 65-0530)
AD-614 538 DIV. 4

•LABORATORIES FOR RESEARCH AND DEVELOPMENT FRANKLIN INST PHILADELPHIA PA
• • •
ELECTRONIC STRUCTURE OF DILUTE SOLID SOLUTION ALLOYS OF 3D-TRANSITION METALS IN A NON-MAGNETIC MATRIX.
AD-614 482 DIV. 25

•LABORATORY FOR ELECTROSCIENCE RESEARCH NEW YORK UNIV N Y
• • •
SR 14
THEORY AND DESIGN OF FREQUENCY CONVERTERS USING COMBINATIONS OF PARAMETRIC ELEMENTS. (AFCRL 65-105)
AD-614 122 DIV. 8
• • •
TR 400 105
THEORY AND DESIGN OF FREQUENCY CONVERTERS USING COMBINATIONS OF PARAMETRIC ELEMENTS. (AFCRL 65-105)
AD-614 122 DIV. 8

•LABORATORY FOR NUCLEAR SCIENCE MASS INST OF TECH CAMBRIDGE
• • •
ISOTROPY OF COSMIC RADIATION
AD-614 381 DIV. 2

•LABORATORY OF CLIMATOLOGY C W THORNTHWAITE ASSOCIATES CENTERTON N J
• • •
TR 2
COASTAL STORMS OF THE EASTERN UNITED STATES,
AD-614 189 DIV. 2

•LANSDALE DIV PHILCO CORP PA
• • •
PROCESS SPECIFICATIONS

AND TEST PROCEDURES: ADDENDUM TO PEM FOR GOLD-DOPED GERMANIUM INFRARED DETECTOR TYPE IR400.
AD-614 013 DIV. 6

•LAVAL UNIV (QUEBEC)
• • •
RECRYSTALLIZATION KINETICS OF MARTENSITIC EXTRA-LOW CARBON STEELS,
AD-614 501 DIV. 17

•LEICESTER UNIV (ENGLAND)
• • •
THE METABOLISM OF SIMPLE CARBON COMPOUNDS IN MICRO-ORGANISMS.
(AFOSR 65-0665)
AD-614 479 DIV. 16

•LINCOLN LAB MASS INST OF TECH LEXINGTON
• • •
SOLID STATE RESEARCH.
(ESD TDR-65-31)
AD-613 961 DIV. 25
• • •
DEVELOPMENT OF HELICAL PHASE-SHIFTERS.
AD-614 069 DIV. 8
• • •
JA 2383
PARTIAL PRESSURES AND GIBBS FREE ENERGY OF FORMATION FOR CONGRUENTLY SUBLIMING CDTE(C),
AD-614 292 DIV. 25
• • •
JA 2390
ELECTROCHEMICAL DEMBER EFFECT IN SEMICONDUCTORS,
AD-614 180 DIV. 25
• • •
JA 2492
ELASTIC CONSTANTS OF HGTE,
AD-614 308 DIV. 25
• • •
JA 2493
SIMPLE CONSTRUCTION FOR DETERMINING THE PHASE CHANGE OF LIGHT REFLECTED AT NORMAL INCIDENCE,
AD-614 309 DIV. 25
• • •
JA 2479
CAUSE OF THE MID-LATITUDE EVENING INCREASE IN FOF2.
AD-614 310 DIV. 2
• • •
JA 2504
OBSERVATION OF INTERBAND TRANSITIONS IN ANTIMONY,
AD-614 312 DIV. 25
• • •
MS 1009
MAGNETIC PROPERTIES OF V(3+) IONS IN CUBIC SPINELS
AD-614 319 DIV. 25
• • •
MS 1131
ELECTRICAL AND ELECTRO-OPTICAL PROPERTIES OF INTERFACE-ALLOY HETEROJUNCTIONS,
AD-614 320 DIV. 25
• • •
MS 895
RAPID-FREEZE METHOD FOR GROWTH OF BISMUTH SINGLE CRYSTALS
AD-614 318 DIV. 17
• • •
MS 923
LONG RANGE COMMUNICATION BY ORBITING DIPOLE BELTS,
AD-614 214 DIV. 5
• • •
TN 1965 11
SIGNAL DISTORTION IN A FREQUENCY DIVIDER,
(ESD TDR-65-99)
AD-614 425 DIV. 8
• • •
TN 1965 7
MEASUREMENTS ON AN L-BAND POWER AMPLIFIER FOR PHASED ARRAYS,
(ESD TDR-65-63)
AD-614 426 DIV. 8
• • •
TR 366
DIGITAL COMMUNICATION OVER FIXED TIMECONTINUOUS CHANNELS WITH MEMORY, WITH SPECIAL APPLICATION TO TELEPHONE CHANNELS,
(ESD TDR-64-564)
AD-614 110 DIV. 8
• • •
TR 368
EFFECTS OF GENERAL RELATIVITY ON INTERPLANETARY TIME-DELAY MEASUREMENTS,
(ESD TDR-64-590)
AD-614 232 DIV. 25
• • •
TR 372
MEASUREMENT OF PROPERTIES OF SPREAD CHANNELS BY THE TWO-FREQUENCY METHOD WITH APPLICATION TO RADAR ASTRONOMY
(ESD TDR-65-29)
AD-614 233 DIV. 2
• • •
TR 379
CALIBRATION OF A PRESSURE SENSOR FOR MEASUREMENTS IN CONTINUUM AND RAREFIED GAS FLOWS,
(ESD TDR-65-43)
AD-614 424 DIV. 20

•LINDEN LABS INC STATE COLLEGE PA
• • •
MACHINING HIGH PURITY ALUMINA.
AD-614 467 DIV. 26

•LITTLE (ARTHUR D) INC CAMBRIDGE MASS
• • •
STUDIES OF THE PHYSICAL CHARACTERISTICS OF PROBABLE LUNAR SURFACE MATERIALS: PART II.
(AFCRL 64-970 P 2)
AD-613 965 DIV. 2

•LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF
• • •
EVIDENCE OF UNPINNED SURFACE SPINS FROM PARALLEL SPIN-WAVE RESONANCES IN PERMALLOY FILMS,
AD-614 359 DIV. 25
• • •
HANLE EFFECT IN THE HE-NE LASER,
AD-614 360 DIV. 25
• • •
INFLUENCE OF BOUNDARY CONDITIONS ON THE MODAL CHARACTERISTICS OF THIN CYLINDRICAL SHELLS.
AD-614 371 DIV. 25
• • •
6 75 65 10
TECHNICAL PROGRESS ON FUNDAMENTAL AND APPLIED RESEARCH PROGRAMS.
AD-614 042 DIV. 20

•LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF
• • •
LMSD 8 19 62 12
EVALUATION OF FIELD-EFFECT TRANSISTORS.
AD-614 268 DIV. 8
• • •
SB 62 92
WRITING AND SUBMITTING THE SUCCESSFUL PROPOSAL.
A SELECTIVE ANNOTATED BIBLIOGRAPHY
AD-614 269 DIV. 26
• • •
6 65 65 3
A PILOT DISPLAY CONCEPT FOR NEAR-TARGET MANEUVERS DURING RENDEZVOUS,
AD-613 958 DIV. 12
• • •
6 74 64 6
BASIC STUDY OF GAS-SOLID INTERACTIONS: I. INTERACTION OF HYDROGEN WITH PLATINIZED CARBON.
AD-614 041 DIV. 4

•LOUVAIN UNIV (BELGIUM)
• • •
QUENCHING AND POST-IRRADIATION STUDIES ON CDS SINGLE CRYSTALS. TRANSPORT PROPERTIES OF BISMUTH ROLLED THIN FOILS.
(RADC R-65-156)
AD-614 485 DIV. 25
• • •
THE SIGNIFICANCE OF SINGULAR CONFIGURATIONS OF STRUCTURES FROM THE STRENGTH OF MATERIALS POINT OF VIEW,
(AFOSR 65-0618)
AD-614 541 DIV. 25

•LUNAR AND PLANETARY LAB UNIV OF ARIZONA TUCSON
• • •
A MODEL OF THE LUNAR SURFACE,
AD-614 169 DIV. 2
• • •
INFRARED PHOTOMETRY OF M-DWARF STARS,
AD-614 354 DIV. 2
• • •
MULTICOLOR PHOTOMETRY OF CARBON STARS,
AD-614 361 DIV. 2

•LUND UNIV (SWEDEN)
• • •
A THEOREM ON RANK ORDERS FOR TWO CENSORED SAMPLES,
AD-614 301 DIV. 15

•MANLABS INC CAMBRIDGE MASS
• • •
ANALYTICAL STUDY OF THE THERMODYNAMIC FACTORS CONTROLLING DIAMOND SYNTHESIS AND GROWTH AT HIGH PRESSURES AND TEMPERATURES.
(AFCRL 65-168)
AD-614 082 DIV. 25
• • •
TR 9
THERMODYNAMICS OF MARTENSITIC F. C. C. REVERSIBLY YIELDS B. C. C. AND F. C. C. REVERSIBLY YIELDS H. C. P. TRANSFORMATIONS IN THE IRONRUTHENIUM SYSTEM
AD-614 009 DIV. 17

•MARINE LAB UNIV OF MIAMI CORAL GABLES FLA
• • •
ANALYSIS OF SPREADING LOSS FOR REFRACTED/ REFLECTED RAYS IN CONSTANT-VELOCITY-GRADIENT MEDIA,
AD-614 196 DIV. 25

•MARYLAND UNIV COLLEGE PARK
• • •
FUNDAMENTAL PROBLEMS OF SOLIDS.
(AFOSR 65-0656)
AD-614 136 DIV. 25
• • •
THE PHI-OMEGA MIXING ANGLE,
(AFOSR 65-0500)
AD-614 171 DIV. 20
• • •
SU(3) SYMMETRY AND THE

NONLEPTONIC K-MESON PROCESSES
(AFOSR 65-0501)
AD-614 172 DIV. 20

• • •

THREE-PARTICLE UNITARITY INTEGRAL,
(AFOSR 65-0502)
AD-614 173 DIV. 25

• • •

REMARKS ON STRANGENESS NON-CONSERVING WEAK LEPTONIC INTERACTIONS,
(AFOSR 65-0504)
AD-614 174 DIV. 20

• • •

UNITARY SYMMETRY AND NON-LEPTONIC K-DECAYS,
(AFOSR 65-0505)
AD-614 175 DIV. 20

• • •

COUPLING OF INTERNAL AND SPACE-TIME SYMMETRIES
(AFOSR 65-0507)
AD-614 181 DIV. 20

*MASSACHUSETTS INST OF TECH CAMBRIDGE

• • •

SOLID-STATE AND MOLECULAR THEORY GROUP.
AD-613 996 DIV. 25

• • •

NEUTRON DIFFRACTION STUDIES OF THE ORDER OF THE ATOMS IN THE P PHASE AND THE R PHASE
(AROD 3259:3)
AD-614 149 DIV. 25

• • •

ON THE OSCILLATIONS OF THE MACLAURIN SPHEROID BELONGING TO THE THIRD HARMONICS,
(AFOSR 4611)
AD-614 155 DIV. 2

• • •

SR 9
ON FACTORING THE CORRELATIONS OF DISCRETE MULTI-VARIABLE STOCHASTIC PROCESSES.
(AFCRL 65-207)
AD-614 040 DIV. 15

*MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METALLURGY

• • •

INFLUENCE OF CONTROLLED ADDITIONS OF OXYGEN ON THE SUPERCONDUCTIVITY OF NIOBIUM
AD-614 296 DIV. 25

• • •

TR 10
THE ROLE OF CARBON AND FINE STRUCTURE IN THE HARDENING OF IRON-NICKEL-CARBON MARTENSITES
AD-614 447 DIV. 17

*MCMASTER UNIV HAMILTON (ONTARIO) DEPT OF METALLURGY AND METAL LURGICAL ENGINEERING

• • •

THE PARABOLIC OXIDATION KINETICS OF BETAZIRCONIUM.
AD-614 556 DIV. 17

*MEASUREMENT ANALYSIS CORP LOS ANGELES CALIF

• • •

MAC 403 01
TRANSDUCERS FOR SONIC FATIGUE MEASUREMENTS,
(FDL TR-64-171)
AD-613 946 DIV. 30

*MELLON INST PITTSBURGH PA

• • •

CYCLOPENTADIENYLCOBALT CARBONYL DIIODIDE,
(AFOSR 65-0540)
AD-614 540 DIV. 4

*MELPAR INC FALLS CHURCH VA

• • •

COMPREHENSIVE BIBLIOGRAPHY FOR MECHANISM OF MICROBIOLOGICAL CONTAMINATION OF JET FUEL AND DEVELOPMENT OF TECHNIQUES FOR DETECTION OF MICROBIOLOGICAL CONTAMINATION, APPENDIX C.
AD-614 139 DIV. 10

• • •

A THIN-PLATE BATTERY. SUPPLEMENT TO THINFILM MONOTRONICS.
AD-614 471 DIV. 7

*MICHIGAN STATE UNIV EAST LANSING DEPT OF BIOPHYSICS

• • •

THE ELECTRICAL CONDUCTIVITY OF PROTEINS IN THE SOLID STATE.
AD-614 440 DIV. 16

*MICROWAVE ASSOCIATES INC BURLINGTON MASS

• • •

STUDY OF PLASMA AMPLIFIERS.
(AFCRL 65-158)
AD-614 253 DIV. 8

*MICROWAVE ELECTRONICS CORP PALO ALTO CALIF

• • •

A THREE-WATT LOW-NOISE TRAVELING-WAVE TUBE FOR C-BAND.
AD-614 125 DIV. 8

• • •

MEDIUM-POWER, LOW-NOISE TUBE DEVELOPMENT.
AD-614 227 DIV. 8

• • •

MEDIUM-POWER, LOW-NOISE TUBE DEVELOPMENT.
AD-614 469 DIV. 8

• • •

MEDIUM-POWER, LOW-NOISE TUBE DEVELOPMENT.
AD-614 470 DIV. 8

*MICROWAVE LAB STANFORD UNIV CALIF

• • •

ML 1275
STUDY OF PARALLEL PUMPING IN MICROWAVE FERRITES.
AD-614 045 DIV. 8

• • •

ML 1290
SATURATION PHENOMENA IN ZN2Y FERRITE AT FREQUENCIES BELOW RESONANCE,
(AFCRL 65-138)
AD-614 235 DIV. 25

• • •

ML 1316
MICROWAVE RESEARCH.
AD-614 099 DIV. 25

• • •

SR 4
SATURATION PHENOMENA IN ZN2Y FERRITE AT FREQUENCIES BELOW RESONANCE,
(AFCRL 65-138)
AD-614 238 DIV. 25

*MICROWAVE RESEARCH INST POLYTECHNIC INST OF BROOKLYN N Y

• • •

SINGULAR NETWORK ELEMENTS.
(AFOSR 65-0621)
AD-613 919 DIV. 8

*MIDWEST RESEARCH INST KANSAS CITY MO

• • •

FRICTION AND WEAR BEHAVIOR OF SOLID FILMS.
(ML TR-65-5)
AD-614 242 DIV. 14

• • •

SYNTHESIS OF ELASTOMERS CONTAINING SI-N BONDS IN THE MAIN CHAIN.
AD-614 473 DIV. 4

*MILAN UNIV (ITALY)

• • •

NEW TRIPHENYLPHOSPHINE HYDRIDES OF RHENIUM (NUOVI IDRURI TRIFENILFOSFINICI DI RENIO),
(AFOSR 65-0611)
AD-614 207 DIV. 4

*MINNESOTA UNIV MINNEAPOLIS

• • •

PROPER MOTIONS FOR EIGHTY WIDE DOUBLE STARS,
AD-614 135 DIV. 2

• • •

PARACHUTE STRESS ANALYSIS DURING INFLATION AND AT STEADY STATE,
AD-614 138 DIV. 1

• • •

TEMPERATURE DEPENDENCE OF THE LIFETIME OF PHOSPHORESCENCE OF SOME POLYNUCLEAR HYDROCARBONS IN VISCOUS SOLUTION,
(AROD 2297:5)
AD-614 530 DIV. 4

• • •

TR 53
RANK ORDER PROBABILITIES: TWO-SAMPLE NORMAL SHIFT ALTERNATIVES,
AD-614 131 DIV. 15

*MINNESOTA UNIV MINNEAPOLIS SCHOOL OF PHYSICS

• • •

EXPERIMENTS ON DYNAMIC POLARIZATION OF PROTONS IN POLYETHYLENE BY THE 'SOLID EFFECT'. A PROPOSED POLARIZED PROTON TARGET,
(AFOSR 119)
AD-614 145 DIV. 20

*MISSISSIPPI STATE UNIV STATE COLLEGE

• • •

ARN 24
A DEVICE FOR THE DIRECT MEASUREMENT OF UNSTEADY AIR FLOWS AND SOME CHARACTERISTICS OF BOUNDARY LAYER TRANSITION.
(TRECOM TR-65-12)
AD-614 008 DIV. 9

*MISSOURI SCHOOL OF MINES AND METALLURGY ROLLA

• • •

TR 12
ELECTROCHEMICAL BEHAVIOR OF TIOX SOLID SOLUTIONS IN AQUEOUS HF AND HF-HCL MIXTURES.
AD-614 183 DIV. 4

*MISSOURI UNIV COLUMBIA

• • •

TR 29
PHOTOELECTRIC EMISSION FROM BARIUM OXIDE.
AD-614 326 DIV. 25

*MITHRAS INC CAMBRIDGE MASS

• • •

MC 63 78 R1
RESEARCH OF AERODYNAMIC METHODS OF PRODUCING ANTENNA WINDOWS IN A PLASMA SHEATH.
(AFCRL 65-65)
AD-614 084 DIV. 8

*MITRE CORP BEDFORD MASS

• • •

W 07109/0000/00/0/00
AN EFFICIENCY FUNCTION FOR RATING MECHANICAL SCAN-TRACK RADARS,
(ESD TR-65-80)
AD-614 477 DIV. 6

*MOORE SCHOOL OF ELECTRICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA

• • •

THE EVALUATION OF TECHNIQUES AND DEVICES AS APPLIED TO PROBLEM SOLVING. (RADC TDR-64-402)
AD-619 228 DIV. 20

•MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV
• • •
SMALL SIGNAL SEMICONDUCTOR COMPOSITES.
AD-619 090 DIV. 8

•NARMCO RESEARCH AND DEVELOPMENT DIV WHITTAKER CORP SAN DIEGO CALIF
• • •
INTERLAMINAR SHEAR OF FILAMENT-WOUND REINFORCED PLASTICS.
AD-613 997 DIV. 14

•NARRAGANSETT MARINE LAB UNIV OF RHODE ISLAND KINGSTON
• • •
REF 65 1
SOME CHARACTERISTICS OF 25-CPS SHALLOW-WATER AMBIENT NOISE.
AD-619 546 DIV. 2
• • •
TR 1
SOME CHARACTERISTICS OF 25-CPS SHALLOW-WATER AMBIENT NOISE.
AD-619 546 DIV. 2

•NATIONAL BUREAU OF STANDARDS BOULDER COLO
• • •
OPTICAL DETECTION OF MICROWAVE TRANSITIONS BETWEEN EXCITED ELECTRONIC STATES OF CN AND THE IDENTIFICATION OF THE TRANSITIONS INVOLVED
AD-619 553 DIV. 25

•NATIONAL BUREAU OF STANDARDS WASHINGTON D C
• • •
TN 255
PLACEBO IV. RULES, CONCO RDANCE, SAMPLE COMPUTER GENERATION
AD-619 257 DIV. 20
• • •
TN 258
A PREREQUISITE TO THE UTILITY OF MICROGRAMMARS.
AD-619 298 DIV. 20

•NATIONAL CO INC MELROSE MASS
• • •
PRODUCTION ENGINEERING MEASURE FOR CESIUM BEAM TUBES.
AD-619 118 DIV. 8

•NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE
• • •
BAND STRUCTURE AND MAGNETISM OF GADOLINIUM METAL, (AFOSR 65-0605)
AD-619 557 DIV. 25
• • •
FARADAY EFFECT IN SOLIDS (AFOSR 65-0609)
AD-619 558 DIV. 25

•NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)
• • •
NRC 8249
THE EFFECT OF NONCELLULOSIC MATERIAL ON THE ACTINIC DEGRADATION OF COTTON FABRIC. PART II: COPPER OXINATE AND NICKEL OXINATE,
AD-619 499 DIV. 14
• • •
NRC 8389
NRC DESIGNS ANTENNA FOR S-BAND BEACON IN SOUNDING ROCKETS. RESONANT SHUNT-FED RADIATOR USES AIR DIELECTRIC TO WITHSTAND HEAT,
AD-619 529 DIV. 8

•NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY
• • •
CO-CATELYSES IN FRIEDEL-CRAFTS REACTIONS. PART VII. THE FORMATION OF ULTRAVIOLET CHROMOPHORES,
AD-619 509 DIV. 4
• • •
NRC 8219
COLLISIONAL DEACTIVATION OF THE EXCITED SINGLET OXYGEN ATOMS AND THEIR INSERTION INTO THE CH BONDS OF PROPANE
AD-619 502 DIV. 4
• • •
NRC 8220
PHOTOCHEMICAL ADDITION OF HYDROGEN BROMIDE TO 2-BUTENE IN THE GAS PHASE,
AD-619 500 DIV. 4
• • •
NRC 8227
PHYSICAL PROPERTIES OF ALPHA AND GAMMA ARSENIC,
AD-619 506 DIV. 17
• • •
NRC 8256
ANIONIC POLYMERIZATION OF BUTADIENE AND STYRENE.
AD-619 498 DIV. 4
• • •
NRC 8261
EFFECT OF PRESSURE ON THE HYDROLYSIS OF METHYL ACETATE AND ETHYLENE OXIDE IN ACETONE + WATER MIXTURES: QUANTITIES OF ACTIVATION AT CONSTANT VOLUME, AND THE ISOKINETIC PRESSURE,
AD-619 516 DIV. 4

•NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF BIOSCIENCES
• • •
NRC 8246
N-ACETYL GROUPS IN VITELLENIN
AD-619 514 DIV. 16
• • •
NRC 8279
A RIBOSOMAL PEPTIDASE FROM ESCHERICHIA COLI B,
AD-619 521 DIV. 16

•NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF CHEMISTRY
• • •
NRC 8267
EXCESS THERMODYNAMIC FUNCTIONS FOR LIQUID MIXTURES OF METHANE+PROPANE,
AD-619 517 DIV. 4

•NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS
• • •
NRC 7886
DEVIATIONS OF THE SPECIFIC HEATS OF THE ALKALI METALS FROM HARMONIC BEHAVIOUR, A POSSIBLE DEPENDENCE ON ISOTOPIC COMPOSITION OF THE ANHARMONIC CONTRIBUTION TO SPECIFIC HEAT
AD-619 503 DIV. 25
• • •
NRC 8121
INFRARED SPECTROSCOPY... WHERE DO WE GO FROM HERE.
AD-619 504 DIV. 25
• • •
NRC 8149
FREE RADICALS BY MASS SPECTROMETRY. XXXII. THERMAL DECOMPOSITION OF CYCLOPENTYL RADICALS,
AD-619 505 DIV. 4
• • •
NRC 8242
A SIMPLIFIED PROCEDURE FOR THE ANALYSIS OF COMPLEX NUCLEAR MAGNETIC RESONANCE SPECTRA. II. THE ANALYSIS OF SYMMETRICAL TRIFLUOROBENZENE, THE AA'A''XX'X'' SYSTEM,
AD-619 507 DIV. 20
• • •
NRC 8250
IDENTIFICATION OF FREE RADICALS IN FLASH PHOTOLYSIS
AD-619 497 DIV. 25
• • •
NRC 8268
LABORATORY INVESTIGATIONS OF THE INTERSTELLAR RADIO-FREQUENCY LINES OF CH AND OTHER MOLECULES,
AD-619 518 DIV. 4
• • •
NRC 8269
CONSTITUTION AND MAGNETIC AND ELECTRICAL PROPERTIES OF PALLADIUM TELLURIDES (PDTE-PDTE2),
AD-619 519 DIV. 17
• • •
NRC 8271
THE SPECIFIC HEATS BELOW 320K OF POTASSIUM, RUBIDIUM AND CAESIUM,
AD-619 520 DIV. 25

•NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AERONAUTICAL ELECTRONIC AND ELECTRICAL
• • •
NADC EL 6504
A SOLID STATE NUCLEAR DETECTOR.
AD-619 432 DIV. 20

•NAVAL AMMUNITION DEPOT CRANE IND
• • •
MN 11
MICRO-NOTES. INFORMATION OF MICROELECTRONICS FOR NAVY AVIONICS EQUIPMENT.
AD-619 116 DIV. 8
• • •
NAD 65 251
MICRO-NOTES. INFORMATION OF MICROELECTRONICS FOR NAVY AVIONICS EQUIPMENT.
AD-619 116 DIV. 8

•NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
• • •
N 700
A SURVEY OF PIPE CORROSION AT NAVAL ACTIVITIES.
AD-619 259 DIV. 13
• • •
R 312
A STUDY OF EFFECTIVE FENDER SYSTEMS FOR NAVY PIERS AND WHARVES.
AD-613 940 DIV. 13
• • •
R 374
LATERAL-PLATE TESTS WITH PLATE DIAMETER VARIED.
AD-613 991 DIV. 2

•NAVAL MEDICAL FIELD RESEARCH LAB CAMP LEJEUNE N C
• • •
MR005.09 1204.4.15
RELATIONSHIP OF RHINOVIRUS INFECTION TO MILD UPPER RESPIRATORY DISEASE. II. EPIDEMIOLOGIC OBSERVATIONS IN MALE MILITARY TRAINEES.
AD-619 305 DIV. 16
• • •

MR005.09 1204.4.16
PATTERNS OF ADENOVIRUS INFECTIONS IN MARINE CORPS PERSONNEL. I. A 42-MONTH SURVEY IN RECRUIT AND NON-RECRUIT POPULATIONS. II. LONGITUDINAL STUDY OF SUCCESSIVE ADVANCED RECRUIT TRAINING COMPANIES.
AD-619 306 DIV. 16

•NAVAL MEDICAL RESEARCH INST BETHESDA MD

• • •

MR 005.02 0020.01 R 4
IMPORTANCE OF PREVENTING RENAL VASCULAR COLLAPSE DURING PERIOD OF RENAL ISCHEMIA IN KIDNEY TRANSPLATATION,
AD-619 298 DIV. 16

• • •

MR 005.03 0301.09 R 2
ON THE ASSIMILATION OF ENERGY FROM INORGANIC SOURCES IN AUTOTROPHIC FORMS OF LIFE
AD-619 299 DIV. 16

• • •

MR 005.06 0001.01 24
REDUCTION AND RE-OXIDATION OF THE DISULPHIDE BONDS OF SOY BEAN TRYPSIN INHIBITOR
AD-619 193 DIV. 16

• • •

MR 005.09 1606.01 R 15
THE LUNG WORM ANGIOSTRONGYLUS CANTONENSIS OF RODENTS ON TAIWAN (FORMOSA) AND THE OFF SHORE ISLANDS,
AD-619 300 DIV. 16

• • •

MR 005.12 5000.02
CHARACTERISTICS OF INSOLUBLE PROTEIN OF TOOTH AND BONE, I. FLUORESCENCE OF SOME ACIDIC HYDROLYTIC FRAGMENTS,
AD-619 211 DIV. 16

• • •

MR 005.12 5000.02 R 10
PHOSPHORESCENCE OF CALCIFIED TISSUES,
AD-619 210 DIV. 16

• • •

MR 005.13 1500.06 1
OPHTHALMOSCOPY OF PIGEONS USING TRANSILLUMINATION,
AD-619 194 DIV. 16

• • •

MR 005.13 4001.06
A REVIEW OF CURRENT CONCEPTS AND PRACTICES USED TO CONTROL BODY HEAT LOSS DURING WATER IMMERSION,
AD-619 241 DIV. 16

• • •

MR005.09 1606.01 R 16
A MONOGENETIC AND SEVEN DIGENETIC TREMATODES OF AMPHIBIANS AND REPTILES FROM PALAWAN ISLAND, PHILIPPINES,
AD-619 302 DIV. 16

• • •

R 11
CHARACTERISTICS OF INSOLUBLE PROTEIN OF TOOTH AND BONE, I. FLUORESCENCE OF SOME ACIDIC HYDROLYTIC FRAGMENTS,
AD-619 211 DIV. 16

• • •

R 3
A REVIEW OF CURRENT CONCEPTS AND PRACTICES USED TO CONTROL BODY HEAT LOSS DURING WATER IMMERSION,
AD-619 241 DIV. 16

•NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

• • •

302 V17 N10
DENTAL OBSERVATIONS MADE WHILE WINTERING IN ANTARCTICA IN 1956-1957.
AD-619 319 DIV. 16

•NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C

• • •

GEOMAGNETIC SURVEY INFORMATION.
AD-619 049 DIV. 2

• • •

TR 166
A STUDY OF AEROMAGNETIC DATA, NEW ENGLAND SEAMOUNT AREA,
AD-619 117 DIV. 2

•NAVAL ORDNANCE LAB WHITE OAK MD

• • •

M 55
PROGRAM FOR THE STABILITY ANALYSIS OF A TOWED BODY.
AD-619 102 DIV. 30

• • •

NOLTR 64 127
MECHANICAL ZERO G DEVICE
AD-613 937 DIV. 22

• • •

NOLTR 64 139
PROGRAM FOR THE STABILITY ANALYSIS OF A TOWED BODY.
AD-619 102 DIV. 30

• • •

NOLTR 64 182
ON EQUATIONS OF STATE IN SHOCK INITIATION PROBLEMS.
AD-613 989 DIV. 4

• • •

NOLTR 64 194
THE GENERALIZATION OF HAMILTON'S MECHANICS. I. THEORY OF HOMOGENEOUS CONTACT TRANSFORMATIONS,
AD-619 029 DIV. 25

• • •

NOLTR 64 204
NEW ARYLOXY ALKOXYSILANES (I).
AD-613 936 DIV. 14

•NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF

• • •

NOTS ADPUB 123
SELECTED BIBLIOGRAPHY OF PUBLICATIONS, PAPERS, AND REPORTS IN THE SOCIAL, BEHAVIORAL, AND ADMINISTRATIVE SCIENCES.
AD-619 066 DIV. 32

• • •

NOTS TP 2813
CONCERNING AN INTEGRAL OCCURRING IN AEROFOIL THEORY (NAVWEPS 7813)
AD-619 139 DIV. 9

• • •

NOTS TP 3028
THEORETICAL STUDIES OF SEA ANIMAL LOCOMOTION. PART I, (NAVWEPS 8038 P1)
AD-619 140 DIV. 9

• • •

NOTS TP 3467
THE EFFECT OF AN INTENSE MAGNETIC FIELD ON ROCKET NOZZLE HEAT TRANSFER. PART 1: THEORY AND SUPERCONDUCTING MAGNET EXPERIMENTS. (NAVWEPS 8494 P1)
AD-613 992 DIV. 27

• • •

NOTS TP 3642
AN EXPERIMENTAL INVESTIGATION OF THE FLOW PHENOMENA INVOLVED IN GASEOUS THRUST DIRECTION CONTROL DEVICES. (NAVWEPS 8615)
AD-619 279 DIV. 27

• • •

NOTS TP 3662
SILICON P-N JUNCTIONS AS AUTOMATIC GAIN CONTROL (AGC) ELEMENTS FOR VIDEO PULSES (NAVWEPS 8630)
AD-619 280 DIV. 8

• • •

NOTS TP 3785
THE ANALYSIS OF ROUND-OFF AND TRUNCATION ERRORS OF THE CONTROLLER IN A HYBRID (DIGITAL-ANALOG) CONTROL SYSTEM (NAVWEPS 8729)
AD-619 281 DIV. 30

• • •

TN 4061 31
A NEW METHOD FOR RAPID MEASUREMENT OF THERMAL DIFFUSIVITY AT ELEVATED TEMPERATURES WITH AN APPLICATION TO A SANDWICH STRUCTURE,
AD-619 034 DIV. 30

• • •

TP 3548
CHAR DEPTH IN NOZZLE INSERTS, (NAVWEPS 8539)
AD-619 260 DIV. 27

•NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

• • •

SKIN FRICTION DRAG AND SHEAR STRESS DISTRIBUTION ON SEVERAL STREAMLINED BODIES OF REVOLUTION WITH VARIED FINENESS RATIO.
AD-619 237 DIV. 9

• • •

A COMPUTER PROGRAM FOR FORECASTING THE WIND DRIFT OF SEA ICE.
AD-619 255 DIV. 2

• • •

THE LEBESGUE-STIELJES INTEGRAL AS APPLIED IN PROBABILITY DISTRIBUTION THEORY.
AD-619 256 DIV. 15

•NAVAL RESEARCH LAB WASHINGTON D C

• • •

NRL 6171
OXIDES ON THE SILVER ELECTRODE. PART 2. X-RAY DIFFRACTION STUDIES OF THE WORKING SILVER ELECTRODE.
AD-619 058 DIV. 7

• • •

NRL 6180
TARGET CAPABILITY VERSUS PRESUMED INTENTION AS A BASIS FOR DECISION IN COMBAT INFORMATION CENTERS.
AD-613 944 DIV. 5

• • •

NRL 6227
REDUCTION OF POLYMERIC FRICTION BY MINOR CONCENTRATIONS OF PARTIALLY FLUORINATED COMPOUNDS.
AD-619 059 DIV. 14

• • •

NRL 6229
DETERMINATION OF RADON CONCENTRATION IN THE AIR THROUGH MEASUREMENT OF ITS SOLID DECAY PRODUCTS.
AD-613 943 DIV. 20

• • •

NRL 6251
THE PRESENT STATUS OF CHEMICAL RESEARCH IN ATMOSPHERE PURIFICATION AND CONTROL ON NUCLEAR-POWERED SUBMARINES.
AD-619 261 DIV. 31

•NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA

• • •

MR005.13 1002
A NOTE ON THE INFLUENCE OF SHIELD GEOMETRY ON AIR DOSE AND TISSUE DOSE FROM PROTONS WITHIN A SPACE VEHICLE (N63 19990)

AD-613 993 DIV. 20

• • •

R 25
A NOTE ON THE INFLUENCE OF SHIELD GEOMETRY ON AIR DOSE AND TISSUE DOSE FROM PROTONS WITHIN A SPACE VEHICLE (N63 19990)
AD-613 993 DIV. 20

•NAVAL WEAPONS LAB DAHLGREN VA

• • •

K 34/63
SOURCES OF METEOROLOGICAL DATA FOR WEAPONS SYSTEMS STUDIES.
AD-614 262 DIV. 22

• • •

NWL 1963
SOME RECENT DEVELOPMENTS IN THE THEORY OF VISCOUS FLUID FLOW WITH TECHNOLOGICAL AND GEOPHYSICAL APPLICATIONS.
AD-614 429 DIV. 9

•NEW MEXICO UNIV ALBUQUERQUE AIR FORCE SHOCK TUBE FACILITY

• • •

EFFECTS OF BOUNDARY FRICTION ON TRANSMISSION OF STATIC STRESS THROUGH AND IN CYLINDRICAL TANKS.
(WL TR-64-108)
AD-614 108 DIV. 13

•NEW YORK STATE COLL OF CERAMICS ALFRED UNIV

• • •

SEMICONDUCTING MATERIALS. PART III. AN INVESTIGATION OF THE DIELECTRIC PROPERTIES OF SINGLE-CRYSTAL VERSUS POLYC RYSTALLINE MATERIALS.
AD-614 472 DIV. 14

•NEW YORK UNIV N Y

• • •

SCATTERING, WEAK DECAYS, AND FINAL-STATE INTERACTIONS IN MODEL THEORIES IN A DRESSED PARTICLE PICTURE,
AD-614 379 DIV. 20

•NORTH AMERICAN AVIATION INC COLUMBUS OHIO

• • •

EFFECTS OF TASK LOADING ON PILOT PERFORMANCE DURING SIMULATED LOW-ALTITUDE HIGH SPEED FLIGHT,
(TRECOM TR-64-69)
AD-614 243 DIV. 28

•NORTH CAROLINA UNIV CHAPEL HILL

• • •

FALLING CHARGES,
(AFOSR 64 0481)
AD-614 166 DIV. 25

• • •

PHOTOGENERATION OF FREE CARRIERS IN ORGANIC CRYSTALS VIA EXCITON-EXCITON INTERACTIONS
AD-614 389 DIV. 25

•NORTHWESTERN UNIV EVANSTON ILL

• • •

DISTANCE MATRIX OF A GRAPH AND ITS REALIZABILITY
(AROD 3298:14)
AD-614 559 DIV. 15

• • •

THE SENSITIVITY OF A TRAFFIC NETWORK,
(AROD 3298:15)
AD-614 560 DIV. 8

•NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST

• • •

A STABILITY CRITERION FOR PULSE-WIDTHMODULATED FEEDBACK CONTROL SYSTEMS.
(AFOSR 65-0627)
AD-614 489 DIV. 30

• • •

A NOTE ON ACTIVE RC REALI ZATION OF VOLTAGE TRANSFER FUNCTIONS.
(AROD 3298:16)
AD-614 554 DIV. 8

•NOTRE DAME UNIV IND

• • •

THERMAL DESORPTION OF SR FROM W,
AD-614 142 DIV. 25

•NUCLEAR METALS INC CONCORD MASS

• • •

BERYLLIUM RESEARCH AND DEVELOPMENT PROGRAM. VOLUME VI. INFLUENCE OF THE DISTRIBUTION OF OXIDE AND THE TOTAL IMPURITY LEVEL ON RECRYSTALLIZATION AND GRAIN GROWTH OF BERYLLIUM.
(ASD TDR-62-509 V6)
AD-613 952 DIV. 17

•OFFICE OF AEROSPACE RESEARCH WASHINGTON D C

• • •

OAR 65 5
OAR CUMULATIVE INDEX OF RESEARCH RESULTS, 1964.
AD-614 096 DIV. 30

•OFFICE OF NAVAL RESEARCH WASHINGTON D C

• • •

GOVERNMENT SOURCES OF R AND D INFORMATION,
AD-614 356 DIV. 32

•OHIO STATE UNIV COLUMBUS

• • •

ON THE CONTACT ANGLE IN HETEROGENEOUS NUCLEATION UPON A SUBSTRATE,
(AROD 4397:1)
AD-614 542 DIV. 25

•OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY

• • •

MS 29
NONPARAMETRIC LIFE TEST SAMPLING PLANS,
AD-614 490 DIV. 15

•ORDNANCE RESEARCH LAB PENNSYLVANIA STATE UNIV UNIVERSITY PARK

• • •

FLEXURAL-WAVE-TRANSMISSION PROPERTIES OF PLATE-JOINT AND ROD-JOINT SYSTEMS,
AD-614 264 DIV. 25

•OSLO UNIV (NORWAY)

• • •

THE GENERAL ORTHOGONALITY THEOREM IN THE HYLLERAAS-SCHERR-KNIGHT VARIATIONAL PERTURBATION METHOD,
(AFOSR 65-0454)
AD-614 220 DIV. 25

• • •

INSTITUTE REPT. NO. 22
ON THE CONCEPTION OF GENERALIZED SPIN OF FREE DIRAC PARTICLES,
(AFOSR 65-0453)
AD-614 219 DIV. 25

•OXFORD UNIV (ENGLAND)

• • •

THE ROLE OF GANGLIOSIDE IN THE MODE OF ACTION OF TETANUS TOXIN,
AD-614 202 DIV. 16

•PACIFIC NAVAL LAB ESQUIMAULT (BRITISH COLUMBIA)

• • •

REPRINT 64 11
PROBLEMS OF ADHESION WITH CATHODIC PROTECTION,
AD-614 551 DIV. 4

• • •

REPRINT 64 4
AN ULTRASONIC METHOD FOR EVALUATING BONDS IN LARGE METALLIC BEARINGS.
AD-614 307 DIV. 26

•PENNSYLVANIA UNIV PHILADELPHIA

• • •

A NOTE ON DERIVATIONS OF OPERATOR ALGEBRAS,
AD-613 926 DIV. 15

• • •

DERIVATIONS OF OPERATOR GROUP ALGEBRAS,
AD-613 927 DIV. 15

• • •

DERIVATIONS OF OPERATOR ALGEBRAS,
AD-613 928 DIV. 15

•PENNSYLVANIA UNIV PHILADELPHIA SCHOOL OF MEDICINE

• • •

WATER AND ELECTROLYTE CONTENT OF NORMAL AND HYPERTENSIVE ARTERIES IN DOGS,
AD-614 561 DIV. 16

•PERKIN-ELMER CORP NORWALK CONN ELECTRO-OPTICAL DIV

• • •

PE TR 7776
TUNABLE COHERENT LIGHT SOURCE.
AD-613 968 DIV. 25

•PHILCO CORP WILLOW GROVE PA BIO-CYBERNETICS LAB

• • •

2386
A CORRELATIONAL STUDY OF MYOPOTENTIAL RESPONSE AND FORCE OF MUSCLE CONTRACTION DURING VARYING ACTIVITY DEMANDS.
AD-613 930 DIV. 30

•PITTSBURGH UNIV PA

• • •

PROGRAMMING METHOD AND RESPONSE MODE IN A VISUAL ORAL TASK.
(AMRL TR-64-129)
AD-614 014 DIV. 28

•PITTSBURGH UNIV PA DEPT OF SOCIOLOGY

• • •

THREAT PERCEPTION AND CIVIL DEFENSE,
AD-614 386 DIV. 18

•PITTSBURGH UNIV PA SCHOOL OF MEDICINE

• • •

ATROPINE DETOXICATION DURING HYPOTHERMIA BY THE ISOLATED PERFUSED RAT LIVER.
(AFOSR 65-0459)
AD-614 068 DIV. 16

•POLYTECHNIC INST OF BROOKLYN N Y

• • •

SHOCK-WAVE PROPAGATION IN LIQUID PROPELLANT ROCKET ENGINES.
(AFOSR 65-0565)
AD-614 201 DIV. 27

• • •

PIBAL 901
A NOTE ON VIBRATIONS OF A BEAM ON AN ELASTIC FOUNDATION
AD-614 072 DIV. 13

• • •

SR 1

ON LINEAR EQUATIONS OF ANISOTROPIC ELASTIC PLATES
AD-614 132 DIV. 25

•POLYTECHNIC INST OF BROOKLYN N Y DEPT OF CHEMISTRY

• • •

POLYMORPHISM OF RARE EARTH DISILICIDES, (AFOSR TN-60-204)
AD-614 137 DIV. 25

•PORTSMOUTH NAVAL SHIPYARD N H

• • •

PORTSMOUTH NAVAL SHIPYARD FACILITIES FOR NOISE MEASUREMENT AND REDUCTION.
AD-614 126 DIV. 21

•PRAIRIE REGIONAL LAB SASKATOON (SASKATCHEWAN)

• • •

BIOSYNTHESIS OF MUSTARD OIL GLUCOSIDES: V. FORMATION OF GLUCONASTURTIIN FROM L-GAMMAPHENYLBUTYRINE-C(14)-N(15) IN WATERCRESS,
AD-614 508 DIV. 16

• • •

NRC 8231
BIOSYNTHESIS OF THE COUMARINS. VI. FURTHER STUDIES ON HERNIARIN FORMATION IN LAVENDER,
AD-614 511 DIV. 16

• • •

NRC 8235
BIOSYNTHESIS OF MUSTARD OIL GLUCOSIDES. VI. BIOSYNTHESIS OF GLUCOBARBARIN IN RESEDA LUTEOLA L,
AD-614 512 DIV. 16

• • •

NRC 8273
MINOR COMPONENTS OF THE OIL OF ARAUCARIA,
AD-614 524 DIV. 4

[illegible]RE TECHNOLOGY CORP OF [illegible]A WOODBRIDGE N J

• • •

AN INVESTIGATION OF BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
AD-613 969 DIV. 17

• • •

AN INVESTIGATION OF BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION.
AD-614 086 DIV. 17

• • •

AN INVESTIGATION OF BE AND W ALTERED BY HIGHPRESSURE DEFORMATION.
AD-614 128 DIV. 17

• • •

AN INVESTIGATION OF BE AND W ALTERED BY HIGHPRESSURE DEFORMATION.
AD-614 129 DIV. 17

• • •

AN INVESTIGATION OF BE AND W ALTERED BY HIGH-PRESSURE DEFORMATION. (N64 32692)
AD-614 236 DIV. 17

•PRINCETON UNIV N J

• • •

EVOKED RESPONSE LATENCY AS A FUNCTION OF STIMULUS RISE-TIME IN THE AUDITORY CORTEX,
AD-614 362 DIV. 16

•PURDUE UNIV LAFAYETTE IND

• • •

CONSIDERATIONS ON THE ISOBAR MECHANISM AND RESONANCE POLES FOR PION-BARYON SYSTEMS (AFOSR 65-0494)
AD-614 143 DIV. 20

• • •

POSSIBLE EXPERIMENTAL CONSEQUENCES OF TRIANGLE SINGULARITIES IN STRANGE-PARTICLE PRODUCTION PROCESSES, (AFOSR 65-0495)
AD-614 144 DIV. 20

• • •

ENERGY PEAKS FOR THREE-BODY MESON SYSTEMS, (AFOSR 65-0496)
AD-614 150 DIV. 20

• • •

MESON EFFECTS IN N-P CAPTURE, (AFOSR 65-0497)
AD-614 151 DIV. 20

• • •

MESON-BARYON SYSTEMS AND THEIR RESONANCES, (AFOSR 65-0498)
AD-614 152 DIV. 20

• • •

CROSSING RELATIONS AND LEGENDRE EXPANSIONS IN PION-PION SCATTERING, (AFOSR 65-0499)
AD-614 153 DIV. 20

• • •

UNITARY SYMMETRY AND WEAK INTERACTIONS. II. SU(3) TRANSFORMATION PROPERTIES (AFOSR 65-0609)
AD-614 154 DIV. 20

• • •

DETERMINATION OF ELECTRON RELAXATION TIME FROM THE GIANT QUANTUM OSCILLATIONS IN THE ACOUSTIC ABSORPTION OF METALS (AROD 2655:12)
AD-614 527 DIV. 25

• • •

EFFECT OF UNIAXIAL STRESS ON THE EXCITATION SPECTRA OF DONORS IN SILICON,
AD-614 529 DIV. 25

• • •

MS 31
SELECTION AND RANKING PROCEDURES AND ORDER STATISTICS FOR THE BINOMIAL DISTRIBUTION
AD-614 U70 DIV. 15

•QUEENS COLL FLUSHING N Y

• • •

DISCUSSION OF THE WEAK AND STRONG PRINCIPLES OF EQUIVALENCE,
AD-614 165 DIV. 25

• • •

ON THE SCALAR THEORY OF GRAVITATION,
AD-614 351 DIV. 25

QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS

• • •

DIFFERENTIAL CROSS SECTIONS FOR ELECTRONS ELASTICALLY SCATTERED BY HELIUM ATOMS
AD-613 929 DIV. 20

•RADIATION EFFECTS INFORMATION CENTER COLUMBUS OHIO

• • •

RADIATION EFFECTS INFORMATION CENTER, MONTHLY ACCESSION LIST. COORDINATE INDEX, PART II, FOR ACCESSION LISTS FROM OCTOBER 1, 1964 TO MARCH 31, 1965.
AD-614 406 DIV. 32

•RADIATION INC MELBOURNE FLA

• • •

R 5
STUDY OF SPECIAL BEAMSHAPING ANTENNAS.
AD-613 932 DIV. 8

•RADIATION LAB UNIV OF MICHIGAN ANN ARBOR

• • •

3648 1 F
DIFFRACTION AND SCATTERING BY REGULAR BODIES, (AFCRL 65-199)
AD-614 046 DIV. 8

•RADIATION SYSTEMS INC ALEXANDRIA VA•

• • •

TR 46
INVESTIGATION OF A MULTIPLE BEAM SCANNING CIRCULAR ARRAY.
AD-614 288 DIV. 8

•RADIO CORP OF AMERICA BURLINGTON MASS AEROSPACE SYSTEMS DIV

• • •

COMPUTER ALGORITHM FOR FAULT ISOLATION AND TEST POINT SELECTION. (APL TR-65-12)
AD-613 968 DIV. 8

•RADIO CORP OF AMERICA MOORESTOWN N J MISSILE AND SURFACE RADAR DIV

• • •

DESIGN OF A HIGH-ENERGY FAST-PULSE POWER SYSTEM, PHASE II. (WL TDR-64-94)
AD-613 959 DIV. 7

•RAND CORP SANTA MONICA CALIF

• • •

P 1596
SOME RESULTS AND PROBLEMS IN STOCHASTIC LINEAR PROGRAMMING
AD-613 990 DIV. 15

• • •

P 2972 2
A NEW LOOK AT CUSTOMS UNION THEORY,
AD-614 407 DIV. 32

• • •

P 3085
SOME COST ACCOUNTING PROBLEMS IN PERT COST,
AD-614 408 DIV. 26

• • •

P 3090
A GUIDE TO THE TYPING OF MATHEMATICAL NOTATION,
AD-613 942 DIV. 24

• • •

P 3100
THE DESIGNER'S IMPACT ON LOGISTICS,
AD-614 057 DIV. 18

• • •

P 3104
THE WORLD MAGNETIC SURVEY AND THE EARTH'S INTERIOR,
AD-614 409 DIV. 2

• • •

P 3108
THE SCIENTIFIC STUDY OF METEORS IN THE 19TH CENTURY
AD-614 411 DIV. 2

• • •

P 3111
GROWTH OF AUTOMATION IN PRELAUNCH CHECKOUT FOR SPACE VEHICLES,
AD-614 410 DIV. 12

• • •

P 3113
FOUR-COLOR REDUCIBILITY OF PLANAR GRAPHS CONTAINING SUBGRAPHS WITH FOUR-POINT BOUNDARIES,
AD-614 412 DIV. 15

• • •

P 3114
A SHORT COURSE IN MODEL DESIGN,
AD-614 413 DIV. 30

• • •

P 3115

A STATISTICAL ANALYSIS OF PHASE ERRORS AND PHASE DIFFERENCE ERRORS DUE TO THE ATMOSPHERE IN THE OBSERVATIONS OF THE RADAR RETURN FROM A SATELLITE,
AD-614 414 DIV. 6

• • •

RM 3894 1 PR
ANNOTATED BIBLIOGRAPHY OF RAND PUBLICATIONS IN COMPUTATIONAL LINGUISTICS,
AD-613 979 DIV. 32

• • •

RM 4250 PR
THE COST OF BASIC RESEARCH EFFORT: AIR FORCE EXPERIENCE, 1954-1964,
AD-614 020 DIV. 30

• • •

RM 4346 PR
FACTORS AFFECTING CODING ERRORS,
AD-614 415 DIV. 8

• • •

RM 4368 ARPA
THE FLOW OF A CONDUCTING GAS JET WITH ALIGNED MAGNETIC FIELD,
AD-614 420 DIV. 25

• • •

RM 4483 PR
THE EFFECTS OF FLUID RESONANCE ON THE BOUNDARY STRESSES OF A FLUID-FILLED CAVITY,
AD-614 418 DIV. 13

• • •

RM 4489 PR
TWO NOTES ON ESTIMATING SHAPE PARAMETERS,
AD-614 419 DIV. 15

• • •

RM 4460 PR
PROGRAMMING BY QUESTIONNAIRE
AD-613 976 DIV. 30

• • •

RM 4467 PR
SOME REFLECTIONS ON A SURVEY OF RESEARCH PROBLEMS IN COMPUTER SOFTWARE,
AD-614 417 DIV. 30

• • •

RM 4526 PR
IMPULSE NOISE AND ERROR PERFORMANCE IN DATA TRANSMISSION
AD-614 416 DIV. 5

• • •

RM 4527 PR
ON THE THEORY OF RANDOM FUNCTIONS AND THE CONTROL OF PROCESSES ON THE BASIS OF INCOMPLETE DATA,
(TT 65-61998)
AD-613 974 DIV. 15

• • •

RM 4539 PR
INVARIANT IMBEDDING AND A REFORMULATION OF THE INTERNAL INTENSITY PROBLEM IN TRANSPORT THEORY,
AD-614 031 DIV. 25

•RAYTHEON CO WALTHAM MASS RESEARCH DIV

• • •

S 694
MICROWAVE NONLINEAR DIELECTRIC MATERIALS.
AD-614 274 DIV. 14

•RCA LABS DIV RADIO CORP OF AMERICA PRINCETON N J

• • •

TUNNELING PROCESSES ACROSS THE CDSELECTROLYTE INTERFACE
(AROD 4017:6)
AD-614 494 DIV. 25

•RCA VICTOR CO LTD MONTREAL (QUEBEC) RESEARCH LABS

• • •

RR 7 801 33
ELECTROMAGNETIC WAVE PROPAGATION IN ANISOTROPIC PLASMAS ALONG THE DIRECTION OF A STATIC MAGNETIC FIELD
(AFCRL 65-84)
AD-614 442 DIV. 25

• • •

SR 1
ELECTROMAGNETIC WAVE PROPAGATION IN ANISOTROPIC PLASMAS ALONG THE DIRECTION OF A STATIC MAGNETIC FIELD
(AFCRL 65-84)
AD-614 442 DIV. 25

•REDSTONE SCIENTIFIC INFORMATION CENTER REDSTONE ARSENAL ALA

• • •

RSIC 383
SOME NEW FREEZE PHOTOELASTIC MATERIALS AND THEIR APPLICATION
(TT 65-62042)
AD-614 278 DIV. 14

• • •

RSIC 388
PHOTOELASTICITY: PRINCIPLES, METHODS AND APPLICATIONS TO MATERIALS TESTING, METALLURGY AND MECHANICS, PARTS I, II, III,
(TT 65-62043)
AD-614 282 DIV. 30

•REDSTONE SCIENTIFIC INFORMATION CENTER REDSTONE ARSENAL ALA

• • •

330
RELIABILITY OF INTEGRATED CIRCUITS USED IN MISSILE SYSTEMS
AD-614 103 DIV. 8

•RESEARCH CENTER FOR GROUP DYNAMICS UNIV OF MICHIGAN ANN ARBOR

• • •

TR 31
GROUP SUCCESS AND THE REDUCTION OF STATUS INCONGRUENCE IN TASK-ORIENTED GROUPS,
AD-614 449 DIV. 28

•RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE

• • •

GENERATION OF A HOT, DENSE PLASMA BY A COLLECTIVE BEAM-PLASMA INTERACTION,
AD-614 384 DIV. 25

• • •

432
SUPERPOSITION IN A CLASS OF NONLINEAR SYSTEMS,
AD-614 483 DIV. 15

•RESEARCH TRIANGLE INST DURHAM N C

• • •

INTEGRATED SILICON DEVICE TECHNOLOGY. VOLUME VI. UNIPOLAR TRANSISTORS,
(ASD TDR-63-316 V6)
AD-613 951 DIV. 8

•RHODE ISLAND UNIV KINGSTON

• • •

7252/3
RESULTS OF SIMULTANEOUS ELF MEASUREMENTS AT BRANNENBURG GERMANY AND KINGSTON, R. I.
(AFCRL 65-200 P1)
AD-614 012 DIV. 2

•RIAS INC BALTIMORE MD

• • •

THE EFFECT OF SUBSTITUTION ON THE IONIZATION POTENTIALS OF FREE RADICALS AND MOLECULES. VII. THEORETICAL RATIONALIZATION FOR DIFFERING CORRELATIONS FOUND FOR BOND DISSOCIATION ENERGIES WITH IONIZATION POTENTIALS AND ELECTRON AFFINITIES OF ORGANIC OR INORGANIC RADICALS
(AFOSR 65-0570)
AD-613 922 DIV. 4

• • •

PROPERTIES OF CONDUCTION ELECTRONS IN IONIC CRYSTALS,
(AFSOR 65-0697)
AD-614 091 DIV. 25

• • •

LCAO-MO SCF CALCULATIONS OF C606 SYSTEMS,
(AFOSR 65-0571)
AD-614 192 DIV. 4

•ROCKETDYNE CANOGA PARK CALIF

• • •

THE ANHARMONICITY CORRECTION FOR POLYATOMIC MOLECULES. PART II. METHANE,
(AFOSR 65-0568)
AD-614 088 DIV. 25

• • •

THE ANHARMONICITY CORRECTION FOR POLYATOMIC MOLECULES. PART I. METHODS AND APPLICATION TO CH2O,
(AFOSR 65-0569)
AD-614 177 DIV. 25

•ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y

• • •

R-65-156
QUENCHING AND POST-IRRADIATION STUDIES ON CDS SINGLE CRYSTALS. TRANSPORT PROPERTIES OF BISMUTH ROLLED THIN FOILS,
AD-614 485 DIV. 25

• • •

TDR-63-300 SUPPL 1
SYSTEM RELIABILITY PREDICTION BY FUNCTION,
AD-614 227 DIV. 8

• • •

TDR-64-402
THE EVALUATION OF TECHNIQUES AND DEVICES AS APPLIED TO PROBLEM SOLVING.
AD-614 228 DIV. 30

• • •

TDR-64-489
ERROR ANALYSIS OF RADAR SET AN/MPN-13.
AD-614 048 DIV. 6

• • •

TDR-64-550
PLASMA KINETIC ENERGY -RF CONVERSION.
AD-614 285 DIV. 8

• • •

TDR-65-96
HIGH POWER X-BAND GENERATOR.
AD-614 001 DIV. 8

• • •

TR-64-320
DEVELOPMENT OF AN ELECTRONIC DATA PROCESSING MODULE FOR MOBILE WING RECONNAISSANCE TECHNICAL SQUADRON.
AD-614 239 DIV. 18

• • •

TR-64-529
RESEARCH ON THE APPLICATION OF FERRO-AND FERRIELECTRIC PHENOMENA IN COMPUTER DEVICES.
AD-614 010 DIV. 30

• • •

TR-64-549
TRADEWIND DUCTING.
AD-614 240 DIV. 8

• • •

TR-64-554
VELOCITY TAPERING IN MICROWAVE AMPLIFIERS.
AD-614 244 DIV. 8

• • •

TR-64-584
INVESTIGATION OF THE STATISTICS OF BREAKDOWN USING NANOSECOND PULSE TECHNIQUES.

AD-619 286 DIV. 2

• • •

TR-65-154
RESEARCH ON ONE MILLIMETER C. W. CARCINOTRON.
AD-619 459 DIV. 8

• • •

TR-65-155
SOME FREQUENCY AND POWER CONVERSION PROPERTIES OF CYCLOTRON WAVES.
AD-619 123 DIV. 8

• • •

TR-65-162
GENERATION OF INFRAMILLIMETRIC WAVES BY MEANS OF ELECTRONIC BEAMS.
AD-619 124 DIV. 8

• • •

TR-65-7
ULTRA HIGH POWER TRANSMISSION LINE TECHNIQUES.
AD-613 953 DIV. 8

• • •

TR-65-79
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-613 994 DIV. 8

• • •

TR-65-82
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-613 995 DIV. 8

• • •

TR-65-83
RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
AD-619 055 DIV. 8

•ROME UNIV (ITALY)

• • •

ASYMPTOTIC BEHAVIOR FOR LARGE IMAGINARY VALUES OF ANGULAR MOMENTUM OF THE AMPLITUDES FOR THE SCATTERING OF A DIRAC PARTICLE ON A CENTRAL SCALAR POTENTIAL.
(AFOSR 65-0478)
AD-619 206 DIV. 25

•S F D LABS INC UNION N J

• • •

RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
(RADC TR-65-79)
AD-613 994 DIV. 8

• • •

RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
(RADC TR-65-82)
AD-613 995 DIV. 8

• • •

RESEARCH AND DEVELOPMENT ON L-BAND CROSSED-FIELD AMPLIFIER CHAIN.
(RADC TR-65-83)
AD-619 055 DIV. 8

• • •

SFD 33 IDR 7
DEVELOPMENT OF AN X-BAND CW CROSSED-FIELD AMPLIFIER.
AD-619 251 DIV. 8

•SASKATCHEWAN UNIV SASKATOON

• • •

ANALYSIS OF A LOADED HIGH-PRESSURE HYDRAULIC ON-OFF SERVOMECHANISM.
AD-619 539 DIV. 26

•SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX

• • •

FLYING STRESS IN RELATION TO FLYING PROFICIENCY.
AD-619 332 DIV. 16

• • •

PAROTID FLUID FLOW RATE, PAROTID FLUID, AND SERUM INORGANIC PHOSPHATE CONCENTRATIONS AS RELATED TO DENTAL CARIES STATUS IN MAN.
AD-619 334 DIV. 16

•SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA

• • •

REF 65 5
DEVELOPMENT AND TESTING OF TAUT-NYLON MOORED INSTRUMENT STATIONS (WITH DETAILS OF DESIGN AND CONSTRUCTION).
AD-619 427 DIV. 2

•SEATO MEDICAL RESEARCH LAB BANGKOK (THAILAND)

• • •

A FIELD TRIAL OF A NEW TRANSPORT MEDIUM FOR COLLECTION OF FECES FOR BACTERIOLOGIC EXAMINATION.
AD-619 191 DIV. 16

•SEATTLE PACIFIC COLL WASH INST FOR RESEARCH

• • •

COSMIC-RAY HEAVY NUCLEI AT THE GEOMAGNETIC EQUATOR
AD-619 549 DIV. 20

•SECON METALS CORP WHITE PLAINS N Y

• • •

METHYLENE BLUE IN THE TREATMENT OF DECABORANE TOXICITY
AD-619 333 DIV. 16

•SHOCKLEY TRANSISTOR DIV CLEVITE TRANSISTOR PALO ALTO CALIF

• • •

NEW CONCEPTS FOR SOLID STATE MICROWAVE GENERATORS.
AD-619 000 DIV. 8

•SLOANE PHYSICS LAB YALE UNIV NEW HAVEN CONN

• • •

A QUANTUM MECHANICAL EVALUATION OF LINE BREADTHS INVOLVED IN TUNED-LASER ABSORPTION AND STIMULATED EMISSION SPECTROSCOPY.
(AROD 4313:6)
AD-619 383 DIV. 25

•SMYTH RESEARCH ASSOCIATES SAN DIEGO CALIF

• • •

SRA 425
TRADEWIND DUCTING.
(RADC TR-64-549)
AD-619 240 DIV. 8

•SPACE SCIENCES LAB GENERAL ELECTRIC CO PHILADELPHIA PA

• • •

R64SD6
AN EXPERIMENTAL STUDY OF LAMINAR NEAR WAKES.
AD-619 004 DIV. 9

• • •

62SD484
DIGITAL FILTERS FOR DATA PROCESSING.
AD-619 033 DIV. 30

•SPERRY RAND RESEARCH CENTER SUDBURY MASS

• • •

SRRC RR 64 70
SPACE-TIME VARIABILITY OF THE THERMAL STRUCTURE OF THE UPPER LAYERS OF THE OCEAN.
AD-619 475 DIV. 2

•STANFORD MEDICAL CENTER PALO ALTO CALIF

• • •

THE IMPORTANCE AND RELIABILITY OF THE ROENTGENOGRAPHIC EXAMINATION OF THE SMALL BOWEL IN PATIENTS WITH TROPICAL SPRUE.
AD-613 918 DIV. 16

•STANFORD RESEARCH INST MENLO PARK CALIF

• • •

THERMAL DIFFUSIVITY OF AMMONIUM PERCHLORATE.
AD-619 081 DIV. 25

• • •

DIGITIZING RIOMETER SYSTEM.
(AFCRL 65-154)
AD-619 247 DIV. 30

•STANFORD UNIV CALIF

• • •

HYPERSONIC VISCOUS FLOW NEAR THE STAGNATION STREAMLINE OF A BLUNT BODY: I. A TEST OF LOCAL SIMILARITY.
(AFOSR 65-0597)
AD-613 915 DIV. 9

• • •

HYPERSONIC VISCOUS FLOW NEAR THE STAGNATION STREAMLINE OF A BLUNT BODY: II. THIRD ORDER BOUNDARY-LAYER THEORY AND COMPARISON WITH OTHER METHODS.
(AFOSR 65-0598)
AD-613 916 DIV. 9

• • •

PREPARATION AND PROTON MAGNETIC RESONANCE STUDIES OF ANHYDROUS AMMONIA.
AD-619 377 DIV. 25

• • •

RADIATIVE CAPTURE OF HE3 BY LI7.
(AROD 3269:9)
AD-619 515 DIV. 20

• • •

TR 80
SEQUENTIAL RANKING PROCEDURES.
AD-619 271 DIV. 15

•STANFORD UNIV CALIF DEPT OF MATERIALS SCIENCE

• • •

SU DMS 65 11
INFLUENCE OF A FINELY DISPERSED SECOND PHASE ON RECRYSTALLIZATION.
AD-613 971 DIV. 17

• • •

SU DMS 65 3
STRUCTURE OF DEFORMED INTERNALLY OXIDIZED ALLOYS
AD-619 080 DIV. 17

• • •

TR 14
STRUCTURE OF DEFORMED INTERNALLY OXIDIZED ALLOYS
AD-619 080 DIV. 17

• • •

TR 15
INFLUENCE OF A FINELY DISPERSED SECOND PHASE ON RECRYSTALLIZATION.
AD-613 971 DIV. 17

• • •

TR 16 SU DMS 65 13
GRAIN BOUNDARY SEGREGATION AND THE COLD WORK PEAK IN IRON CONTAINING CARBON OR NITROGEN.
AD-613 970 DIV. 17

•SYDNEY UNIV (AUSTRALIA)

• • •

THE PROPAGATION OF ACOUSTIC WAVES THROUGH THE SOLAR CHROMOSPHERE.
(AFOSR 65-0559)
AD-613 914 DIV. 2

• • •

THE STELLAR INTERFEROMETER AT NARRABRI.
(AFOSR 65-0450)

AD-619 936 DIV. 2

•SYRACUSE UNIV N Y

• • •

NATURE OF THE RESONANCE IN THE STATIC PION-NUCLEON SCATTERING IN ONE-MESON APPROX IMATION,
(AFOSR 880)
AD-619 934 DIV. 20

• • •

INTERACTION OF A STARTING VORTEX AS WELL AS A VORTEX STREET WITH A TRAVELING SHOCK WAVE.
(AROD 3242:2)
AD-619 311 DIV. 9

•SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

• • •

SR 2
PRESERVATION OF UNAMBIGUITY AND INHERENT AMBIGUITY IN CONTEXT FREE LANGUAGES.
(AFCRL 65-178)
AD-619 073 DIV. 30

• • •

TM 728/011/00
PRESERVATION OF UNAMBIGUITY AND INHERENT AMBIGUITY IN CONTEXT FREE LANGUAGES.
(AFCRL 65-178)
AD-619 073 DIV. 30

•SYSTEMS ENGINEERING GROUP RESEARCH AND TECHNOLOGY DIV WRIGHT-PATTERSON AFB

• • •

SEG TR 65 1
INTEGRATION AND EVALUATION OF THE PHASE I NAVIGATIONAL CAPABILITY FOR PROGRAM 665A, UTILIZING THE AN/ASN-24V(MOD) DIGITAL COMPUTER,
AD-619 941 DIV. 19

• • •

TR 65 4
ENVIRONMENTAL CONDITIONS TO BE CONSIDERED IN THE STRUCTURAL DESIGN OF AIRCRAFT REQUIRED TO OPERATE AT LOW LEVELS.
AD-619 460 DIV. 1

•SYSTEMS INC ORLANDO FLA

• • •

PEM FOR FILTER, QUARTZ CRYSTAL, 112 MC, TYPE EL-FR (X=2) AND CRYSTAL UNIT, FILTER, QUARTZ TYPES CR-(XM-69)/U AND CR-(XM-65)/U.
AD-619 229 DIV. 8

•SYSTEMS RESEARCH AND DEVELOPMENT SERVICE FEDERAL AVIATION AGENCY WASHINGTON D C

• • •

RD 65 21
COMPARISON OF TWO VHF COMMUNICATION FREQUENCY ASSIGNMENT METHODS,
AD-619 443 DIV. 19

•TECHNICAL OPERATIONS RESEARCH BURLINGTON MASS

• • •

TO B 65 19
RELATIVE ADVANTAGES OF INTERFEROMETER OVER TELESCOPE FOR MEASURING SOURCE SIZES.
(AFCRL 65-179)
AD-619 248 DIV. 30

•TECHNISCHE HOCHSCHULE HANNOVER (GERMANY)

• • •

TN 3
THE ADIABATIC LINEAR STARK EFFECT IN A PLASMA,
(AFCRL 65-192)
AD-619 283 DIV. 25

•TECHNISCHE HOCHSCHULE VIENNA (AUSTRIA)

• • •

SR 10
THEORIES OF THE DIFFERENTIAL-THERMAL-RESP. MAGNETO-THERMAL-ANALYSIS. A DETAILED DESCRIPTION OF THE TWO APPARATUS AND OF FURTHER MEASUREMENTS ON RE-MN-ALLOYS,
AD-619 465 DIV. 17

• • •

SR 11
X-RAY-, DTA-AND THERMO-MAGNETICAL ANALYSIS OF Y, SM, GD, DY, HO, ER-MN-COMPOUNDS
AD-619 466 DIV. 17

• • •

SR 7
INVESTIGATORS OF THE SYSTEMS Y-MN, GD-MN AND SM-MN,
AD-619 462 DIV. 17

• • •

SR 8
THE COMPOUNDS DYMN2, HOMN2 AND ERMN2. CALCULATION OF THE ENERGY AND FREE ENTHALPY OF FORMATION OF RE-MERCURY-COMPOUNDS BY VAPOUR PRESSURE MEASUREMENTS AND THERMAL ANALYSIS
AD-619 463 DIV. 25

• • •

SR 9
A SINTER PROCESS, USING MERCURY AS AN 'AUXILIARY COMPONENT' AS APPLIED TO RE-MN SYSTEMS, (A SUMMARIZING DISCUSSION). DIFFERENTIAL-THERMAL-AND MAGNETO-THERMALANALYSIS OF THE SYSTEM GD-MN (0 -50 W.% MN),
AD-619 464 DIV. 17

•TEMPLE UNIV PHILADELPHIA PA SCHOOL OF MEDICINE

• • •

DIFFERENTIATION OF NEVOID BASAL CELL CARCINOMA FROM EPITHELIOMA ADENOIDES SYSTICUM; A CLINICOPATHOLOGIC AND HISTO CHEMICAL STUDY,
AD-619 353 DIV. 16

•TEXAS INSTRUMENTS INC DALLAS

• • •

U3 807240 3
MICROELECTRONIC FREQUENCY AND TIME STANDARD.
AD-619 999 DIV. 8

•TEXAS UNIV AUSTIN

• • •

RESONANT ABSORPTION OF ULTRASOUND BY OPEN-ORBIT ELECTRONS IN CADMIUM,
AD-619 372 DIV. 25

•THEORETICAL CHEMISTRY INST UNIV OF WISCONSIN MADISON

• • •

CALCULATION OF SPIN-SPIN INTERACTION INTEGRALS
AD-619 379 DIV. 25

• • •

GIBBS' THIRD VARIATIONAL PRINCIPLE IN STATISTICAL THERM ODYNAMICS,
AD-619 380 DIV. 25

•TORONTO UNIV (ONTARIO)

• • •

THERMAL CONVECTION DURING HORIZONTAL SOLIDIFICATION OF PURE METALS AND ALLOYS.
AD-619 182 DIV. 17

•TRACOR INC AUSTIN TEX

• • •

TRACOR 65 172 U
ELECTROCHEMICAL STUDIES IN THE SYNTHESIS OF N-F COMPOUNDS.
AD-619 098 DIV. 4

•TRG INC MELVILLE N Y

• • •

SR 3
FABRY-PEROT RESONANCES AT SMALL FRESNEL NUMBERS,
(AFCRL 65-174)
AD-619 063 DIV. 25

• • •

SR 4
THEORY OF COHERENCE FOR THE QUANTIZED ELECTROMAGNETIC FIELD,
(AFCRL 65-227)
AD-619 062 DIV. 25

• • •

SR 5
RESONANCES IN THE SPECTRAL ENERGY DENSITY OF THERMAL FIELDS AND SPONTANEOUS EMISSION
(AFCRL 65-228)
AD-619 061 DIV. 25

•TUFTS UNIV MEDFORD MASS

• • •

DIELECTRIC DISPERSION.
AD-619 933 DIV. 25

•UNIVAC DIV SPERRY RAND CORP ST PAUL MINN

• • •

PX 3287
DEVELOPMENT OF AN ELECTRONIC DATA PROCESSING MODULE FOR MOBILE WING RECONNAISSANCE TECHNICAL SQUADRON.
(RADC TR-64-520)
AD-619 239 DIV. 18

•UNIVERSITY COLL LONDON (ENGLAND)

• • •

THE REARRANGEMENT OF AROMATIC N-NITROAMINES. PART III. THE ACID-CATALYSED REARRANGE MENT OF N-NITROANILINE,
(AFOSR 65-0516)
AD-619 215 DIV. 4

•UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES

• • •

SOAP FILMS AND SOME PROBLEMS IN SURFACE AND COLLOID CHEMISTRY
(AFOSR 65-0517)
AD-619 293 DIV. 4

• • •

A CORE ALIGNER DESIGNED TO RECOVER ORIENTED RECENT MARINE CORES,
AD-619 331 DIV. 2

•UTAH STATE UNIV OF AGRICULTURAL AND APPLIED SCIENCE LOGAN

• • •

PYROLYSIS STUDIES. XII. STERIC INHIBITION OF RESONANCE IN THE VAPOR PHASE,
(AFOSR 65-0536)
AD-619 921 DIV. 4

•VALLEY FORGE SPACE TECHNOLOGY CENTER PHILADELPHIA PA

• • •

65SD216
THE QUANTIFICATION OF HUMAN RELIABILITY. A FEASIBILITY DEMONSTRATION.
AD-619 134 DIV. 28

•VIRGINIA POLYTECHNIC INST BLACKSBURG

• • •

THE OXIDATION OF ARSENIC (III) AND ANTIMONY (III).
(AFOSR 65-0662)
AD-619 476 DIV. 4

•VIRGINIA UNIV CHARLOTTESVILLE LIBRARY

• • •

SCIENCE-TECHNOLOGY SUBJECT-HEADING LISTS IN ENGLISH,

RECENT OR STILL USEFUL IN PROGRAMMING INFORMATION RETRIEVAL SYSTEMS.
AD-619 438 DIV. 32

•WALTER REED ARMY INST OF RESEARCH WASHINGTON D C

• • •

COULOMETRIC DETERMINATION OF PROTEIN NITROGEN,
AD-619 341 DIV. 16

• • •

THE EFFECT OF DEXTRAN ON PLATELET FACTOR 3 ACTIVITY IN VITRO AND IN VIVO STUDIES
AD-619 342 DIV. 16

• • •

ELECTRON SPIN RESONANCE CHARACTERISTICS OF SOME NORMAL TISSUES: EFFECT OF MICROWAVE POWER,
AD-619 343 DIV. 16

• • •

EVALUATION OF ELECTRONIC MEASUREMENTS OF HEMAGGLUTINATION FOR QUANTITATIVE STUDIES. I. LIMITATIONS IN THE APPLICATION OF INSTRUMENT MEASUREMENTS
AD-619 344 DIV. 16

• • •

EXTENT OF ANTIGENIC VARIATION OF A2 INFLUENZA VIRUSES FROM PROTOTYPE STRAINS,
AD-619 345 DIV. 16

• • •

METABOLIC RESPONSES DURING MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG
AD-619 346 DIV. 16

• • •

MYOCARDIAL REACTIVE HYPEREMIA IN THE UNANESTHETIZED DOG
AD-619 347 DIV. 16

• • •

THE NATURE OF ANTIBODIES FOLLOWING EXPERIMENTAL ARBOVIRUS INFECTION IN GUINEA PIGS,
AD-619 348 DIV. 16

• • •

PULMONARY MICROTHROMBI
AD-619 349 DIV. 16

• • •

SYNTHESIS OF ETHYL P-NITROPHENYL ALPHAMETHOXYALKYL-PHOSPHONATES,
AD-619 350 DIV. 4

• • •

THAM DIALYSIS: AN EXPERIMENTAL METHOD TO STUDY DIFFUSION OF CERTAIN WEAK ACIDS IN VIVIO. II. SECONARBITAL,
AD-619 355 DIV. 16

• • •

USE OF HIGHLY ACID SUPPORTING ELECTROLYTES IN POLAROGRAPHY. OBSERVED CHANGES IN POLAR OGRAPHIC WAVES OF SELENIUM (IV) UPON STANDING,
AD-619 382 DIV. 4

• • •

MODES OF COMMUNICATION USED BY MILITARY PATIENTS DIAGNOSED AS SCHIZOPHRENIC (ACUTE), AS ALCOHOLIC (CHRONIC) AND BY MILITARY OFFENDERS (AWOL),
AD-619 562 DIV. 28

•WASHINGTON UNIV SEATTLE

• • •

REF M64 27
PHYSICAL AND CHEMICAL DATA FOR PUGET SOUND AND APPRO ACHES, SEPTEMBER 1956DECEMBER 1957,
AD-619 455 DIV. 2

• • •

REF M64 60
SEDIMENTS OF WILLAPA SUBMARINE CANYON,
AD-619 454 DIV. 2

• • •

REF M64 68
PHYSICAL, CHEMICAL AND BIOLOGICAL DATA FROM THE NORTHEAST PACIFIC OCEAN: COLUMBIA RIVER EFFLUENT AREA, JULY-AUGUST 1961,
AD-619 456 DIV. 2

• • •

TR 108
VARVED MARINE SEDIMENTS IN A STAGNANT FJORD,
AD-619 327 DIV. 2

• • •

TR 110
PHYSICAL AND CHEMICAL DATA FOR PUGET SOUND AND APPRO ACHES, SEPTEMBER 1956DECEMBER 1957,
AD-619 455 DIV. 2

• • •

TR 111
SEDIMENTS OF WILLAPA SUBMARINE CANYON,
AD-619 454 DIV. 2

• • •

TR 112
PHYSICAL, CHEMICAL AND BIOLOGICAL DATA FROM THE NORTHEAST PACIFIC OCEAN: COLUMBIA RIVER EFFLUENT AREA, JULY-AUGUST 1961,
AD-619 456 DIV. 2

•WASHINGTON UNIV SEATTLE COLL OF ENGINEERING

• • •

TR 85
DIPOLE EXCITED UNIDIRECTI ONALLY CONDUCTING SPHERE. (AFCRL 64-919)
AD-619 078 DIV. 8

•WASHINGTON UNIV ST LOUIS MO SCHOOL OF MEDICINE

• • •

PHYSIOLOGICAL CORRELATES OF MENTAL DISEASE,
AD-619 148 DIV. 16

•WATERLOO UNIV (ONTARIO)

• • •

HOT-ELECTRON LOSS VIA WIGGLED AUGER RECOMBINATION IN SEMICONDUCTORS,
AD-619 358 DIV. 25

•WATERVLIET ARSENAL N Y

• • •

WVT 6808
THE BAUSCHINGER EFFECT IN A HIGH STRENGTH STEEL.
AD-619 115 DIV. 17

•WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL)

• • •

RESEARCH ON MEASUREMENT OF PRESSURE INDUCED SHIFTS OF ABSORPTION LINES IN THE INFRARED SPECTRUM. (AFCRL 65-224)
AD-619 224 DIV. 25

• • •

TN 14
DETERMINATION OF THE CRYSTAL STRUCTURE OF YTTRIUM ORTHOFERRITE AND REFINEMENT OF GADOLINIUM ORTHOFERRITE.
AD-619 495 DIV. 25

•WESTERN RESERVE UNIV CLEVELAND OHIO

• • •

MAGNETIC DIPOLE MOMENTS OF ODD-MASS NUCLEI IN THE SPHERICAL REGION,
AD-619 496 DIV. 20

•WESTINGHOUSE ELECTRIC CORP PITTSBURGH PA

• • •

LONG LIFE CLOSED LOOP

MHD RESEARCH AND DEVELOPMENT UNIT.
AD-619 458 DIV. 25

•WESTINGHOUSE RESEARCH LABS PITTSBURGH PA

• • •

ELECTRON-ION RECOMBINATION IN NITROGEN, (AROD 3511:2)
AD-619 160 DIV. 2

• • •

MAGNETIC AND ELECTRICAL ANOMALIES IN LACOO3,
AD-619 216 DIV. 25

• • •

QTR 7
GROWTH AND CHARACTERIZATION OF SINGLE CRYSTALS OF RARE EARTH COMPOUNDS.
AD-619 435 DIV. 25

•WISCONSIN UNIV MADISON

• • •

LEWIS ACID ADDUCTS OF GROUP IV-A AZIDES, (AFOSR 65-0533)
AD-613 920 DIV. 4

• • •

SYNTHESIS OF A SILAZAROPH ENANTHRENE, (AFOSR 65-0532)
AD-613 923 DIV. 4

• • •

A NOVEL REARRANGEMENT OF 1,2-BIS (TRIMETHYLSILYL)-HYDRAZINE, (AFOSR 65-0534)
AD-619 290 DIV. 4

•WISCONSIN UNIV MADISON DEPT OF METEOROLOGY

• • •

TR 16
THE ROLE OF PHYSIOLOGY AND ENVIRONMENT IN THE DISTRIBUTION OF ARCTIC PLANTS,
AD-619 079 DIV. 2

•WOODS HOLE OCEANOGRAPHIC INSTI TUTION MASS

• • •

REF. 65 11
DEEP SUBMERGENCE RESEARCH.
AD-619 483 DIV. 30

• • •

REF 65 1
THE MECHANICAL AND CHEMICAL PROPERTIES OF THE HY 100 PRESSURE HULLS OF THE SUBMARINE, ALVIN.
AD-619 011 DIV. 31

• • •

REF 65 19
INERTIAL BOUNDARY CURRENT OF SIMILARITY TYPE IN HOMOGENEOUS AND STRATIFIED OCEANS.
AD-619 097 DIV. 2

• • •

REF 65 4
A SHIPBOARD CABLE-HAULING SYSTEM FOR LARGE ELECTRICAL CABLES,
AD-619 071 DIV. 31

•YALE UNIV NEW HAVEN CONN

• • •

SCATTERING OF PIONS BY LIGHT NUCLEI, (AFOSR 65-0508)
AD-619 087 DIV. 20

• • •

ANALYSIS OF NUCLEON TRANSFER DATA, (AROD 893:100)
AD-619 089 DIV. 20

CONTRACT INDEX

•AF AFOSR 274 64
PURDUE UNIV LAFAYETTE IND
(AFOSR 65-0499)
AD-614 153 DIV. 20

•AF AFOSR 394-63
YALE UNIV NEW HAVEN CONN
(AFOSR 65-0508)
AD-614 087 DIV. 20

•AF AFOSR-274-64
PURDUE UNIV LAFAYETTE IND
(AFOSR 65-0496)
AD-614 150 DIV. 20

•AF AFOSR1 63
HARVARD UNIV CAMBRIDGE MASS
DIV OF ENGINEERING AND APPLIED PHYSICS
(AFOSR 65-0557)
AD-614 492 DIV. 9

•AF AFOSR149 65
KANSAS STATE UNIV MANHATTAN
(AFOSR 65-0537)
AD-614 491 DIV. 4

•AF AFOSR153 63
NORTH CAROLINA UNIV CHAPEL HILL
(AFOSR 65 0481)
AD-614 166 DIV. 25

•AF AFOSR210 63
VIRGINIA POLYTECHNIC INST
BLACKSBURG
(AFOSR 65-0662)
F AD-614 476 DIV. 4

•AF AFOSR224 63
GEORGE WASHINGTON UNIV WASHINGTON D C SCHOOL OF ENGINEERING AND APPLIED SCIENCE
F AD-614 229 DIV. 25

•AF AFOSR232 64
CALIFORNIA UNIV BERKELEY
(AFOSR 65-0493)
AD-614 167 DIV. 20

•AF AFOSR270 63
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
(AFOSR 65-0627)
AD-614 489 DIV. 30

•AF AFOSR272 63
ELECTRICAL ENGINEERING RESEARCH LAB UNIV OF ILLINOIS URBANA
(AFOSR 65-0661)
F AD-614 007 DIV. 25
(AFOSR 65-044)
AD-614 092 DIV. 8

•AF AFOSR274 64
PURDUE UNIV LAFAYETTE IND
(AFOSR 65-0495)
AD-614 144 DIV. 20
(AFOSR 65-0497)
AD-614 151 DIV. 20
(AFOSR 65-0498)
AD-614 152 DIV. 20
(AFOSR 65-0609)
AD-614 154 DIV. 20

•AF AFOSR276 64
PURDUE UNIV LAFAYETTE IND
(AFOSR 65-0494)
AD-614 143 DIV. 20

•AF AFOSR299 63
SYDNEY UNIV (AUSTRALIA)
(AFOSR 65-0459)
AD-613 914 DIV. 2

•AF AFOSR30 63
COLORADO UNIV BOULDER
(AFOSR 65-0476)
AD-614 537 DIV. 20

•AF AFOSR302 63
SYDNEY UNIV (AUSTRALIA)
(AFOSR 65-0450)
AD-614 536 DIV. 2

•AF AFOSR369 63
INSTITUTE FOR THE STUDY OF METALS UNIV OF CHICAGO ILL
(AFOSR 65-0539)
AD-614 289 DIV. 25

•AF AFOSR400 64
INSTITUTE FOR FLUID DYNAMICS AND APPLIED MATHEMATICS
UNIV OF MARYLAND COLLEGE
(AFOSR 65-0602)
AD-614 158 DIV. 15

•AF AFOSR410 63
HARVARD UNIV CAMBRIDGE MASS
(AFOSR 65-0458)
F AD-614 486 DIV. 16

•AF AFOSR42 63
IMPERIAL COLL OF SCIENCE AND TECH LONDON (ENGLAND)
(AFOSR 65-0479)
AD-614 184 DIV. 25
ROME UNIV (ITALY)
(AFOSR 65-0478)
AD-614 206 DIV. 25

•AF AFOSR500 64
BROOKHAVEN NATIONAL LAB UPTON N Y
(AFOSR 65-0506)
AD-614 176 DIV. 20
MARYLAND UNIV COLLEGE PARK
(AFOSR 65-0500)
AD-614 171 DIV. 20
(AFOSR 65-0501)
AD-614 172 DIV. 20
(AFOSR 65-0502)
AD-614 173 DIV. 25
(AFOSR 65-0504)
AD-614 174 DIV. 20
(AFOSR 65-0505)
AD-614 175 DIV. 20
(AFOSR 65-0507)
AD-614 181 DIV. 20

•AF AFOSR521 64
ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL
(AFOSR 65-0509)
AD-614 168 DIV. 2

•AF AFOSR580 64
MELLON INST PITTSBURGH PA
(AFOSR 65-0540)
AD-614 540 DIV. 4

•AF AFOSR602 64
INDIANA UNIV BLOOMINGTON
DEPT OF CHEMISTRY
(AFOSR 65-0682)
AD-614 534 DIV. 25

•AF AFOSR62 14
KANSAS UNIV LAWRENCE DEPT OF CHEMISTRY
(AFOSR 65-0525)
AD-613 924 DIV. 4
(AFOSR 65-0527)
AD-614 195 DIV. 4
(AFOSR 65-0530)
AD-614 538 DIV. 4

•AF AFOSR62 27
ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL
(AFOSR 65-0468)
AD-614 217 DIV. 2

•AF AFOSR62 294
WISCONSIN UNIV MADISON
(AFOSR 65-0533)
AD-613 920 DIV. 4
(AFOSR 65-0532)
AD-613 923 DIV. 4
(AFOSR 65-0534)
AD-614 290 DIV. 4

•AF AFOSR62 268
UTAH STATE UNIV OF AGRICULTURAL AND APPLIED SCIENCE LOGAN
(AFOSR 65-0536)
AD-613 921 DIV. 4

•AF AFOSR62 280
MICROWAVE RESEARCH INST POLYTECHNIC INST OF BROOKLYN N Y
(AFOSR 65-0621)
AD-613 919 DIV. 8

•AF AFOSR62 298
ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL
(AFOSR 65-0471)
AD-614 539 DIV. 20

•AF AFOSR62 46
MARYLAND UNIV COLLEGE PARK
(AFOSR 65-0656)
F AD-614 136 DIV. 25

•AF AFOSR629 64
ELECTRONICS RESEARCH LAB UNIV OF CALIFORNIA BERKELEY
(AFOSR 65-0630)
AD-614 164 DIV. 30

•AF AFOSR64 9
MILAN UNIV (ITALY)
(AFOSR 65-0611)
AD-614 207 DIV. 4

•AF AFOSR7 63
ILLINOIS UNIV URBANA ENGINEERING EXPERIMENT STATION
(AFOSR 65-0582)
AD-614 006 DIV. 30

•AF AFOSR77 63
CALIFORNIA UNIV LOS ANGELES
(AFOSR 65-0624)
AD-614 528 DIV. 15

•AF AFOSR87 64
PITTSBURGH UNIV PA SCHOOL OF MEDICINE
(AFOSR 65-0459)
F AD-614 068 DIV. 16

•AF AFOSR96 63
STANFORD UNIV CALIF
(AFOSR 65-0597)
AD-613 915 DIV. 9
(AFOSR 65-0598)
AD-613 916 DIV. 9

•AF AFOSR98 63
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
(AROD 3298:16)
AD-614 554 DIV. 8

•AF EOAR46 64
IMPERIAL COLL OF SCIENCE AND TECH LONDON (ENGLAND)
(AFOSR 65-0462)
AD-614 493 DIV. 20

•AF EOAR62 107
LOUVAIN UNIV (BELGIUM)
(AFOSR 65-0618)
AD-614 541 DIV. 25

•AF EOAR62 79
EDINBURGH UNIV (SCOTLAND)
(AFOSR 65-0664)
F AD-614 478 DIV. 16

•AF EOAR63 17
LEICESTER UNIV (ENGLAND)
(AFOSR 65-0665)
F AD-614 479 DIV. 16

•AF 61 052 594
CHALMERS UNIV OF TECH GOTHENBURG (SWEDEN)

TN 5 RR 50
(RADC TR-65-155)
AD-614 123 DIV. 8

•AF03R403 63
CENTER FOR DOCUMENTATION AND COMMUNICATION RESEARCH WESTERN RESERVE UNIV CLEVELAND
CSL TR 2
(AFOSR 65-0387)
AD-614 005 DIV. 32

•AF04 611 9972
FIRESTONE FLIGHT SCIENCES LAB CALIF INST OF TECH PASADENA
AD-614 484 DIV. 10

•AF04 647 269
SPACE SCIENCES LAB GENERAL ELECTRIC CO PHILADELPHIA PA
62SD484
AD-614 033 DIV. 30

•AF04 647 617
SPACE SCIENCES LAB GENERAL ELECTRIC CO PHILADELPHIA PA
62SD484
AD-614 033 DIV. 30

•AF04 694 474
SPACE SCIENCES LAB GENERAL ELECTRIC CO PHILADELPHIA PA
R64SD6
AD-614 004 DIV. 9

•AF04 694 486
SPACE SCIENCES LAB GENERAL ELECTRIC CO PHILADELPHIA PA
R64SD6
AD-614 004 DIV. 9

•AF04 695 269
AEROSPACE CORP LOS ANGELES CALIF
TOR 269(4110 01) 30
AD-614 002 DIV. 12
TOR 269(4110 01) 39
AD-614 003 DIV. 12

•AF19 604 6655
RADIATION LAB UNIV OF MICHIGAN ANN ARBOR
3648 1 F
(AFCRL 65-199)
F AD-614 046 DIV. 8

•AF19 604 7292
RHODE ISLAND UNIV KINGSTON
7252/3
(AFCRL 65-200 P1)
F AD-614 012 DIV. 2

•AF19 604 7378
MASSACHUSETTS INST OF TECH CAMBRIDGE
SR 9
(AFCRL 65-207)
AD-614 040 DIV. 15

•AF19 604 7393
ENGINEERING PSYCHOLOGY LAB UNIV OF MICHIGAN ANN ARBOR
3780 23 F
(ESD TDR-64-601)
F AD-613 949 DIV. 28

•AF19 604 7960
CRYOGENIC ENGINEERING LAB MASS INST OF TECH CAMBRIDGE
(AFCRL 65-1)
F AD-613 967 DIV. 25

•AF19 604 8817
TRG INC MELVILLE N Y
SR 5
(AFCRL 65-228)
AD-614 061 DIV. 25
SR 4
(AFCRL 65-227)
AD-614 062 DIV. 25
SR 3
(AFCRL 65-174)
AD-614 063 DIV. 25

•AF19 628 1633
GEOPHYSICS CORP OF AMERICA BEDFORD MASS
GCA TR 64 13 A
(AFCRL 64-874)
AD-614 085 DIV. 2

•AF19 628 2390
MITRE CORP BEDFORD MASS
M 07109/0000/00/0/00
(ESD TR-65-80)
AD-614 477 DIV. 6

•AF19 628 2466
MANLABS INC CAMBRIDGE MASS
(AFCRL 65-168)
F AD-614 082 DIV. 25

•AF19 628 2763
WASHINGTON UNIV SEATTLE COLL OF ENGINEERING
TR 85
(AFCRL 64-919)
AD-614 078 DIV. 8

•AF19 628 3418
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
SR 2
(AFCRL 65-178)
AD-614 073 DIV. 30

•AF19 628 342
MICROWAVE LAB STANFORD UNIV CALIF
SR 4
(AFCRL 65-138)
AD-614 235 DIV. 25

•AF19 628 356
MASSACHUSETTS INST OF TECH CAMBRIDGE
AD-613 996 DIV. 25

•AF19 628 367
RADIATION SYSTEMS INC ALEXANDRIA VA•
TR 46
F AD-614 288 DIV. 8

•AF19 628 379
LABORATORY FOR ELECTROSCIENCE RESEARCH NEW YORK UNIV N Y
SR 14
(AFCRL 65-105)
AD-614 122 DIV. 8

•AF19 628 382
BOLT BERANEK AND NEWMAN INC CAMBRIDGE MASS
(ESD TDR-64-507)
AD-614 336 DIV. 5

•AF19 628 3825
ELECTRO-DYNAMICS LABS UTAH STATE UNIV LOGAN
SR 3
(AFCRL 65-181)
AD-614 272 DIV. 30

•AF19 628 3882
MITHRAS INC CAMBRIDGE MASS
MC 63 78 R1
(AFCRL 65-65)
AD-614 084 DIV. 8

•AF19 628 3871
TECHNICAL OPERATIONS RESEARCH BURLINGTON MASS
TO B 65 19
(AFCRL 65-179)
F AD-614 248 DIV. 30

•AF19 628 3880
AMERICAN METEOROLOGICAL SOCIETY BOSTON MASS
T R 462
(TT 65-61977)
AD-613 978 DIV. 2
T R 458
(TT 65-61978)
AD-613 979 DIV. 2
T R 450
(TT 65-61979)
AD-613 980 DIV. 25
T R 460
(TT 65-61980)
AD-613 981 DIV. 2
T RC 23
(TT 65-61981)
AD-613 982 DIV. 2

•AF19 628 3995
BOLT BERANEK AND NEWMAN INC CAMBRIDGE MASS
1225
(AFCRL 65-170)
F AD-614 287 DIV. 30

•AF19 628 4071
RCA VICTOR CO LTD MONTREAL (QUEBEC) RESEARCH LABS
RR 7 801 33
(AFCRL 65-84)
AD-614 442 DIV. 25

•AF19 628 409
STANFORD RESEARCH INST MENLO PARK CALIF
(AFCRL 65-154)
F AD-614 247 DIV. 30

•AF19 628 421
LITTLE (ARTHUR D) INC CAMBRIDGE MASS
(AFCRL 64-970 P 2)
F AD-613 965 DIV. 2

•AF19 628 452
MICROWAVE ASSOCIATES INC BURLINGTON MASS
(AFCRL 65-158)
F AD-614 253 DIV. 8

•AF19 628 500
LINCOLN LAB MASS INST OF TECH LEXINGTON
(ESD TDR-65-31)
AD-613 961 DIV. 25
F AD-614 069 DIV. 8
JA 2390
AD-614 180 DIV. 25
MS 923
AD-614 214 DIV. 5
TR 368
(ESD TDR-64-590)
AD-614 232 DIV. 25
TR 372
(ESD TDR-65-29)
AD-614 233 DIV. 2
JA 2383
AD-614 292 DIV. 25
JA 2452
AD-614 308 DIV. 25
JA 2475
AD-614 309 DIV. 25
JA 2479
AD-614 310 DIV. 2
JA 2506
AD-614 312 DIV. 25
MS 895
AD-614 318 DIV. 17
MS 1009
AD-614 319 DIV. 25
MS 1131
AD-614 320 DIV. 25
TN 1965 11
(ESD TDR-65-59)
AD-614 425 DIV. 8
TN 1965 7
(ESD TDR-65-63)
AD-614 426 DIV. 8
TR 366
(ESD TDR-64-564)
AD-614 110 DIV. 8
TR 379
(ESD TDR-65-43)

AD-614 424 DIV. 30

•AF29 601 5817
ILLINOIS UNIV URBANA
(WL TR-64-157)
F AD-614 481 DIV. 13

•AF29 601 6002
NEW MEXICO UNIV ALBUQUERQUE
AIR FORCE SHOCK TUBE FACILITY
(WL TR-64-108)
AD-614 108 DIV. 13

•AF29 601 6085
RADIO CORP OF AMERICA MOORESTOWN N J MISSILE AND SURFACE RADAR DIV
(WL TDR-64-94)
AD-613 959 DIV. 7

•AF29 601 6213
GENERAL DYNAMICS FORT WORTH TEX
FZK 211
(WL TR-64-138)
F AD-613 983 DIV. 30
FZK 215
(WL TR-64-145)
AD-614 037 DIV. 20
FZK 199
(WL TR-64-161)
AD-614 038 DIV. 25
FZK 197
(WL TR-64-162)
AD-614 039 DIV. 25
FZK 208
(WL TR-64-160)
AD-614 109 DIV. 16
GENERAL DYNAMICS/FORT WORTH TEX NUCLEAR AEROSPACE RESEARCH FACILITY
FZK 207
(WL TR-64-146)
F AD-614 112 DIV. 8
FZK 201
(WL TR-64-151)
AD-614 250 DIV. 20
FZK 210
(WL TR-64-140)
AD-614 451 DIV. 20
FZK 209
(WL TR-64-137)
AD-614 452 DIV. 20

•AF30 1 1807 GRANT
YALE UNIV NEW HAVEN CONN
(AROD 893:1001)
AD-614 089 DIV. 20

•AF30 602 2533
S F D LABS INC UNION N J
(RADC TR-65-79)
AD-613 994 DIV. 8
(RADC TR-65-82)
AD-613 995 DIV. 8
(RADC TR-65-83)
AD-614 055 DIV. 8

•AF30 602 2756
EITEL-MCCULLOUGH INC SAN CARLOS CALIF
(RADC TDR-64-96)
AD-614 001 DIV. 8

•AF30 602 2781
BRADDOCK DUNN AND MCDONALD INC EL PASO TEX
(RADC TR-64-584)
F AD-614 286 DIV. 2

•AF30 602 2838
ARINC RESEARCH CORP WASHINGTON D C
(RADC TDR-63-300 SUPPL 1)
AD-614 227 DIV. 8

•AF30 602 2868 GRANT
MICROWAVE RESEARCH INST POLYTECHNIC INST OF BROOKLYN N Y
(AFOSR 65-0621)
AD-613 919 DIV. 8

•AF30 602 2975
BENDIX FIELD ENGINEERING CORP OWINGS MILLS MD
(RADC TDR-64-489)
F AD-614 048 DIV. 6

•AF30 602 2981
ADVANCED KINETICS INC COSTA MESA CALIF
(RADC TDR-64-590)
F AD-614 285 DIV. 8

•AF30 602 2990
GENERAL ELECTRIC CO SCHENECTADY N Y
(RADC TR-65-7)
AD-613 953 DIV. 8

•AF30 602 3065
MOORE SCHOOL OF ELECTRICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA
(RADC TDR-64-402)
F AD-614 228 DIV. 20

•AF30 602 3171
UNIVAC DIV SPERRY RAND CORP ST PAUL MINN
PX 3287
(RADC TR-64-520)
F AD-614 239 DIV. 18

•AF30 602 3363
SMYTH RESEARCH ASSOCIATES SAN DIEGO CALIF
SRA 425
(RADC TR-64-549)
F AD-614 240 DIV. 8

•AF30 602 3569
ELECTRON PHYSICS LAB UNIV OF MICHIGAN ANN ARBOR
TR 81
(RADC TR-64-554)
AD-614 244 DIV. 8

•AF33 615 1121
DEFENSE METALS INFORMATION CENTER COLUMBUS OHIO
DMIC M 202
AD-613 957 DIV. 17

•AF33 615 1314
MEASUREMENT ANALYSIS CORP LOS ANGELES CALIF
MAC 403 01
(FDL TR-64-171)
AD-613 946 DIV. 30

•AF33 615 1347
RADIO CORP OF AMERICA BURLINGTON MASS AEROSPACE SYSTEMS DIV
(APL TR-65-12)
AD-613 960 DIV. 8

•AF33 615 1383
DELCO-REMY DIV GENERAL MOTORS CORP ANDERSON IND
AD-614 119 DIV. 7

•AF33 615 1998
RESEARCH TRIANGLE INST DURHAM N C
(ASD TDR-63-316 V6)
AD-613 951 DIV. 8

•AF33 616 7065
NUCLEAR METALS INC CONCORD MASS
(ASD TDR-62-909 V6)
F AD-613 952 DIV. 17

•AF33 616 7175
PITTSBURGH UNIV PA
(AMRL TR-64-129)
F AD-614 014 DIV. 28

•AF33 616 7292
HUGHES AIRCRAFT CO NEWPORT BEACH CALIF
AD-614 468 DIV. 8

•AF33 657 10122
MIDWEST RESEARCH INST KANSAS CITY MO
(ML TR-65-3)
AD-614 242 DIV. 14

•AF33 657 11184
MINNESOTA UNIV MINNEAPOLIS
AD-614 138 DIV. 1

•AF33 657 11467
FEDERAL SCIENTIFIC CORP NEW YORK
(AL TDR-64-251)
AD-614 238 DIV. 19

•AF33 657 11737
PURDUE UNIV LAFAYETTE IND
MS 31
AD-614 070 DIV. 15

•AF33 657 7313
GRUMMAN AIRCRAFT ENGINEERING CORP BETHPAGE N Y
(FDL TDR-64-82)
AD-614 444 DIV. 9

•AF33 657 7578
INSTITUTE FOR RESEARCH IN VISION OHIO ST
5
(AMRL TR-65-24)
F AD-614 249 DIV. 16

•AF33 657 8096
ISOMET CORP PALISADES PARK N J
(AMRL TR-64-140)
F AD-614 226 DIV. 16

•AF33 657 8311
WESTINGHOUSE ELECTRIC CORP PITTSBURGH PA
AD-614 458 DIV. 25

•AF33 657 8744
LABORATORIES FOR RESEARCH AND DEVELOPMENT FRANKLIN INST PHILADELPHIA PA
S AD-614 482 DIV. 25

•AF33 657 8860
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
(ARL 65-2)
AD-614 457 DIV. 9

•AF33 657 8871
CATHOLIC UNIV OF AMERICA WASHINGTON D C
(RADC TR-64-529)
F AD-614 010 DIV. 30

•AF33 657 9186
MELPAR INC FALLS CHURCH VA
AD-614 133 DIV. 10

•AF41 609 2743
DATA-DESIGN LABS ONTARIO CALIF
AD-614 224 DIV. 23

•AF49 638 1017
RIAS INC BALTIMORE MD
(AFSOR 65-0657)
F AD-614 091 DIV. 25

•AF49 638 1135
ROCKETDYNE CANOGA PARK CALIF
(AFOSR 65-0568)
AD-614 088 DIV. 25
(AFOSR 65-0569)
AD-614 177 DIV. 25

•AF49 638 1193
POLYTECHNIC INST OF BROOKLYN N Y DEPT OF CHEMISTRY
(AFOSR TN-60-209)
AD-614 137 DIV. 25

•AF49 638 1220

RIAS INC BALTIMORE MD
(AFOSR 65-0570)
AD-613 922 DIV. 4
(AFOSR 65-0571)
AD-614 192 DIV. 4

•AF49 638 1224
AERONAUTICAL RESEARCH ASSOCIATES OF PRINCETON INC N J
(AFOSR 65-0554)
AD-614 294 DIV. 25

•AF49 638 1245
WESTINGHOUSE RESEARCH LABS PITTSBURGH PA
AD-614 216 DIV. 25
QTR 7
AD-614 435 DIV. 25

•AF49 638 1266
ANTENNA LAB CALIF INST OF TECH PASADENA
TR 34
(AFOSR 65-0653)
AD-614 273 DIV. 8

•AF49 638 1290
POLYTECHNIC INST OF BROOKLYN N Y
SR 1
AD-614 132 DIV. 25

•AF49 638 1325
AEROSPACE RESEARCH CENTER GENERAL PRECISION INC LITTLE FALLS N J
(AFOSR 65-0617)
AD-614 299 DIV. 2

•AF49 638 1346
CORNELL UNIV ITHACA N Y
AD-614 159 DIV. 9

•AF49 638 1468
NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE
(AFOSR 65-0605)
AD-614 557 DIV. 25
(AFOSR 65-0604)
AD-614 558 DIV. 25

•AF49 638 165
POLYTECHNIC INST OF BROOKLYN N Y
(AFOSR 65-0565)
AD-614 201 DIV. 27

•AF49 638 209
ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL
(AFOSR 65-0464)
AD-614 187 DIV. 20
(AFOSR 65-0463)
AD-614 213 DIV. 20

•AF49 638 309
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES
(AFOSR 65-0917)
AD-614 293 DIV. 4

•AF49 638 42
CHICAGO UNIV ILL
(AFOSR 4612)
AD-614 156 DIV. 2
MASSACHUSETTS INST OF TECH CAMBRIDGE
(AFOSR 4611)
AD-614 155 DIV. 2

•AF49 638 607
FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY WASHINGTON D C
(AFOSR 386)
F AD-614 146 DIV. 16

•AF49 638 699
AVCO EVERETT RESEARCH LAB EVERETT MASS
(AFOSR 65-0566)
AD-614 212 DIV. 30

•AF49 638 700
RAND CORP SANTA MONICA CALIF
RM 4527 PR
(TT 65-61998)
AD-613 974 DIV. 15
RM 3894 1 PR
AD-613 975 DIV. 32
RM 4460 PR
AD-613 976 DIV. 30
RM 4290 PR
AD-614 030 DIV. 30
RM 4539 PR
AD-614 031 DIV. 25
RM 4346 PR
AD-614 415 DIV. 8
RM 4526 PR
AD-614 416 DIV. 5
RM 4467 PR
AD-614 417 DIV. 30
RM 4453 PR
AD-614 418 DIV. 13
RM 4459 PR
AD-614 419 DIV. 15

•AF49 638 716
CORNELL UNIV ITHACA N Y
AD-614 548 DIV. 4

•AF49 638 801
SYRACUSE UNIV N Y
(AFOSR 880)
AD-613 934 DIV. 20

•AF49 638 811
MINNESOTA UNIV MINNEAPOLIS SCHOOL OF PHYSICS
(AFOSR 119)
AD-614 145 DIV. 20

•AF49 638 904
CALIFORNIA UNIV BERKELEY
AD-614 335 DIV. 2
AD-614 352 DIV. 2

•AF49 638 965 GRANT
STANFORD UNIV CALIF
(AFOSR 65-0597)
AD-613 915 DIV. 9
(AFOSR 65-0598)
AD-613 916 DIV. 9

•AF61 052 103
CENTRE D'ETUDES DE PHYSIOLOGIE NERVEUSE ET D'ELECTROPHYSIOLOGIE PARIS (FRANCE)•
(AFOSR TN-60-1314)
AD-614 510 DIV. 16

•AF61 052 134
OSLO UNIV (NORWAY)
INSTITUTE REPT. NO. 22
(AFOSR 65-0453)
AD-614 219 DIV. 25
(AFOSR 65-0454)
AD-614 220 DIV. 25

•AF61 052 161
TECHNISCHE HOCHSCHULE HANNOVER (GERMANY)
TN 3
(AFCRL 65-192)
AD-614 283 DIV. 25

•AF61 052 388
WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL)
(AFCRL 65-224)
F AD-614 234 DIV. 25

•AF61 052 609
TECHNISCHE HOCHSCHULE VIENNA (AUSTRIA)
SR 7
AD-614 462 DIV. 17
SR 8
AD-614 463 DIV. 25
SR 9
AD-614 464 DIV. 17
SR 10
AD-614 465 DIV. 17
SR 11
AD-614 466 DIV. 17

•AF61 052 629
CENTRE DE PHYSIQUE ELECTRONIQUE ET CORPUSCULAIRE ORSAY (FRANCE)
WR 1318
(RADC TR-65-154)
F AD-614 459 DIV. 8

•AF61 052 647
CAMBRIDGE LANGUAGE RESEARCH UNIT (ENGLAND)
M L 171
(AFOSR 65-0513)
F AD-614 093 DIV. 32

•AF61 052 654
WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL)
TN 14
AD-614 495 DIV. 25

•AF61 052 66
UNIVERSITY COLL LONDON (ENGLAND)
(AFOSR 65-0516)
AD-614 215 DIV. 4

•AF61 052 662
GROUP FOR THE ADVANCEMENT OF SPECTROSCOPIC METHODS PARIS (FRANCE)
(AFCRL 65-204)
F AD-613 966 DIV. 30

•AF61 052 675
INNSBRUCK UNIV (AUSTRIA)
SR 10
(NP 14785;)
AD-614 050 DIV. 25
SR 8
(NP 14784;)
AD-614 051 DIV. 25
SR 11
(NP 14789;)
AD-614 052 DIV. 25
SR 13
(NP 14787)
AD-614 053 DIV. 25

•AF61 052 719
CENTRE DE PHYSIQUE ELECTRONIQUE ET CORPUSCULAIRE ORSAY (FRANCE)
WR 1344
(RADC TR-65-162)
AD-614 124 DIV. 8

•AF61 052 776
LOUVAIN UNIV (BELGIUM)
(RADC R-65-156)
F AD-614 485 DIV. 25

•AT11 1 209
INDIANA UNIV BLOOMINGTON
DEPT OF CHEMISTRY
AD-614 313 DIV. 16
AD-614 314 DIV. 16
AD-614 218 DIV. 16

•AT11 1 50
MINNESOTA UNIV MINNEAPOLIS
SCHOOL OF PHYSICS
(AFOSR 119)
AD-614 145 DIV. 20

•AT11 1 686
KANSAS UNIV LAWRENCE DEPT OF CHEMISTRY
(AFOSR 65-0524)
AD-614 291 DIV. 4

•AT11 1 686 GRANT
KANSAS UNIV LAWRENCE DEPT OF CHEMISTRY
(AFOSR 65-0525)
AD-613 924 DIV. 4
(AFOSR 65-0527)
AD-614 195 DIV. 4

•AT11 1 686 38 GRANT

KANSAS UNIV LAWRENCE DEPT OF CHEMISTRY
(AFOSR 65-0930)
AD-614 538 DIV. 4

•AT11 1 73
MISSOURI SCHOOL OF MINES AND METALLURGY ROLLA
TR 12
AD-614 183 DIV. 4

•AT30 1 3211
CORNELL UNIV ITHACA N Y
AD-614 548 DIV. 4

•AT99 7 2938
NAVAL RESEARCH LAB WASHINGTON D C
NRL 6229
AD-613 943 DIV. 20

•DA AMC36 039 6367
COLORADO STATE UNIV FORT COLLINS
CER69EJP14
F AD-614 067 DIV. 9

•DA ARO D31 124G210
SYRACUSE UNIV N Y
(AROD 3242:2)
AD-614 311 DIV. 9

•DA ARO D31 124G236
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METALLURGY
AD-614 296 DIV. 25

•DA ARO D31 124G298
INSTITUTE FOR THE STUDY OF RATE PROCESSES UNIV OF UTAH SALT LAKE CITY
AD-614 083 DIV. 4

•DA ARO D31 124G409
DUKE UNIV DURHAM N C
(AROD 3581:7)
AD-614 544 DIV. 4

•DA ARO D31 124G499
CALIFORNIA UNIV LOS ANGELES
(AROD 1517:71)
AD-614 543 DIV. 15

•DA ARO D31 124G524
COATES CHEMICAL LABS LOUISIANA STATE UNIV BATON ROUGE
(AROD 4706:1)
AD-614 197 DIV. 25

•DA ARO D31 124G548
CALIFORNIA UNIV BERKELEY
(AROD 362:65)
AD-614 526 DIV. 15

•DA ARO D31 124G607
YALE UNIV NEW HAVEN CONN
(AROD 893:100)
AD-614 089 DIV. 20

•DA ARO D31 124G83
ELECTRONICS RESEARCH LAB UNIV OF CALIFORNIA BERKELEY
(AROD 362:66)
AD-613 917 DIV. 15

•DA AROD31 124G157
CHICAGO UNIV ILL
(AROD 2160:16)
AD-614 157 DIV. 15

•DA AROD31 124G223
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
(AROD 3298:16)
AD-614 554 DIV. 8

•DA AROD31 124G355
FLORIDA STATE UNIV TALLAHASSEE
(AROD 3605:1)
AD-614 547 DIV. 4

•DA AROD31 124G373
FLORIDA STATE UNIV TALLAHASSEE
(AROD 3605:1)
AD-614 547 DIV. 4

•DA01 021AMC11528Z
BROWN ENGINEERING CO INC HUNTSVILLE ALA RESEARCH LABS
TN R 138
AD-613 962 DIV. 27

•DA01 021AMC203Z
BATTELLE MEMORIAL INST COLUMBUS OHIO
(RSIC 330)
AD-614 103 DIV. 8

•DA11 022ORD3941
HONEYWELL RESEARCH CENTER HOPKINS MINN
(AROD 2884:31)
AD-614 263 DIV. 14
(AROD 2884:4)
F AD-614 265 DIV. 14

•DA19 129AMC147N
FOOD MACHINERY AND CHEMICAL CORP PRINCETON N J
PCR 397
AD-613 945 DIV. 4

•DA19 129AMC277N
DENVER UNIV COLO DEPT OF GEOGRAPHY
65 1 DRI 2214
F AD-614 441 DIV. 2

•DA23 072ORD1687
MIDWEST RESEARCH INST KANSAS CITY MO
F AD-614 473 DIV. 4

•DA28 043AMC00120E
FAIRCHILD SEMICONDUCTOR RESEARCH AND DEVELOPMENT LABS PALO ALTO CALIF
AD-614 047 DIV. 8

•DA28 043AMC00326E
HUGHES AIRCRAFT CO CULVER CITY CALIF
AD-614 445 DIV. 25

•DA28 043AMC00389S
RADIATION INC MELBOURNE FLA
R 5
AD-613 932 DIV. 8

•DA31 124 ARO D17
PURDUE UNIV LAFAYETTE IND
AD-614 529 DIV. 25

•DA31 124ARO D173
DELAWARE UNIV NEWARK DEPT OF PHYSICS
AD-614 439 DIV. 25

•DA31 124ARO D43
CORNELL UNIV ITHACA N Y
TR 7
(AROD 2810:7)
AD-614 533 DIV. 25

•DA31 124AROD84
RCA LABS DIV RADIO CORP OF AMERICA PRINCETON N J
(AROD 4017:6)
AD-614 494 DIV. 25

•DA36 039ORD2939
WESTINGHOUSE RESEARCH LABS PITTSBURGH PA
(AROD 3511:2)
AD-614 160 DIV. 2

•DA36 039AMC00001E
SHOCKLEY TRANSISTOR DIV CLEVITE TRANSISTOR PALO ALTO CALIF
AD-614 000 DIV. 8

•DA36 039AMC01457
NATIONAL CO INC MELROSE MASS
AD-614 118 DIV. 8

•DA36 039AMC01466E
LANSDALE DIV PHILCO CORP PA
AD-614 013 DIV. 6

•DA36 039AMC03200E GRANT
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE 432
AD-614 483 DIV. 15

•DA36 039AMC03212E
MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV
F AD-614 090 DIV. 8

•DA36 039AMC03389E
RAYTHEON CO WALTHAM MASS RESEARCH DIV
S 694
F AD-614 274 DIV. 14

•DA36 039AMC03633E
BULOVA WATCH CO WOODSIDE N Y ELECTRONICS DIV
AD-614 074 DIV. 8

•DA36 039AMC03634E
LINDEN LABS INC STATE COLLEGE PA
AD-614 467 DIV. 26

•DA36 039AMC03638E
SYSTEMS INC ORLANDO FLA
AD-614 223 DIV. 8

•DA36 039SC85977
INTERNATIONAL RECTIFIER CORP LOS ANGELES CALIF
AD-614 446 DIV. 8

•DA36 039SC86741
AEROPROJECTS INC WEST CHESTER PA
AD-614 450 DIV. 26

•DA99 177AMC66T
NORTH AMERICAN AVIATION INC COLUMBUS OHIO
(TRECOM TR-64-69)
AD-614 243 DIV. 28

•DA99 177AMC892T
MISSISSIPPI STATE UNIV STATE COLLEGE
ARN 24
(TRECOM TR-65-12)
AD-614 008 DIV. 9

•DA99 177AMC93T
KAMAN AIRCRAFT CORP BLOOMFIELD CONN
(TRECOM TR-65-2)
F AD-614 231 DIV. 1

•DA99 193MD2413
CHICAGO UNIV ILL
AD-614 522 DIV. 16

•DA91 591EUC2947
INNSBRUCK UNIV (AUSTRIA)
SSR 9
AD-614 049 DIV. 25

•DBR7910 26
LAVAL UNIV (QUEBEC)
AD-614 501 DIV. 17

•DRB5501 15
WATERLOO UNIV (ONTARIO)
AD-614 358 DIV. 25

•DRB9510 35
BRITISH COLUMBIA UNIV (VANCOUVER)
AD-614 200 DIV. 25

•DRB9512 20
EATON ELECTRONICS RESEARCH LAB MCGILL UNIV MONTREAL (QUEBEC)

AD-614 357 DIV. 25

•DRB9550 15
SASKATCHEWAN UNIV SASKATOON
AD-614 535 DIV. 26

•GRANT AF AFOSR131 63
FLUID DYNAMICS RESEARCH LAB
MASS INST OF TECH CAMBRIDGE
65 1
(AFOSR 65-0192)
AD-614 230 DIV. 9

•GRANT AF AFOSR62 14
KANSAS UNIV LAWRENCE DEPT
OF CHEMISTRY
(AFOSR 65-0524)
AD-614 291 DIV. 4

•GRANT PHS MH2795
WASHINGTON UNIV ST LOUIS
MO SCHOOL OF MEDICINE
AD-614 148 DIV. 16

•NASA R38
NAVAL MEDICAL RESEARCH INST
BETHESDA MD
MR 005.03 0301.09 R 2
AD-614 299 DIV. 16

•NASW976
GEOPHYSICS CORP OF AMERICA
BEDFORD MASS
GCA TR 64 13 A
(AFCRL 64-874)
AD-614 083 DIV. 2

•NGR05 002 028
CALIFORNIA INST OF TECH PASADENA
AD-614 323 DIV. 2

•NORSR89290
CTS KNIGHTS INC SANDWICH
ILL
AD-614 433 DIV. 8
AD-614 434 DIV. 8

•NORSR89503
S F D LABS INC UNION N J
SFD 33 IDR 7
AD-614 251 DIV. 8

•NORSR91206
DUMONT (ALLEN B) LABS DIV
FAIRCHILD CAMERA AND INSTRUMENT
CORP CLIFTON N J
SI 5874 REV. 1
AD-614 448 DIV. 8

•NORSR91322
MICROWAVE ELECTRONICS CORP
PALO ALTO CALIF
AD-614 125 DIV. 8

•NORSR91352
TEXAS INSTRUMENTS INC DALLAS
U3 807240 3
AD-613 999 DIV. 8

•NONR G00079 64
ARIZONA UNIV TUCSON
AD-614 170 DIV. 2
LUNAR AND PLANETARY LAB UNIV
OF ARIZONA TUCSON
AD-614 169 DIV. 2

•NONR 122434
RESEARCH CENTER FOR GROUP
DYNAMICS UNIV OF MICHIGAN
ANN ARBOR
TR 31
AD-614 449 DIV. 28

•NONR120207
WISCONSIN UNIV MADISON DEPT
OF METEOROLOGY
TR 16
AD-614 079 DIV. 2

•NONR122436
COOLEY ELECTRONICS LAB UNIV
OF MICHIGAN ANN ARBOR
TR 161
S AD-614 480 DIV. 8

•NONR122444
INSTITUTE OF SCIENCE AND TECH
UNIV OF MICHIGAN ANN ARBOR
4864 9 X
AD-614 032 DIV. 30

•NONR122824
TR 3
AD-614 550 DIV. 25

•NONR150301
NEW YORK STATE COLL OF CERAMICS
ALFRED UNIV
F AD-614 472 DIV. 14

•NONR150906
IOWA STATE UNIV IOWA CITY
65 8
AD-614 101 DIV. 2

•NONR150906 GRANT
IOWA STATE UNIV IOWA CITY
65 7
AD-614 100 DIV. 2

•NONR162301
NOTRE DAME UNIV IND
AD-614 142 DIV. 25

•NONR183412
ILLINOIS UNIV URBANA DEPT
OF PHYSICS
AD-613 977 DIV. 25
AD-614 044 DIV. 25

•NONR183420
ELECTRICAL ENGINEERING RESEARCH
LAB UNIV OF ILLINOIS URBANA
F AD-614 370 DIV. 16

•NONR184134
MASSACHUSETTS INST OF TECH
CAMBRIDGE
AD-613 996 DIV. 25

•NONR184138
MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF METALLURGY
TR 10
AD-614 447 DIV. 17

•NONR185825
JAMES FORRESTAL RESEARCH CENTER
PRINCETON UNIV N J
FLD 11
AD-613 939 DIV. 9

•NONR186607
CRUFT LAB HARVARD UNIV CAMBRIDGE
MASS
AD-614 130 DIV. 30

•NONR186616
CRUFT LAB HARVARD UNIV CAMBRIDGE
MASS
AD-614 130 DIV. 30

•NONR189200
MINNESOTA UNIV MINNEAPOLIS
AD-614 135 DIV. 2

•NONR212124
CHICAGO UNIV ILL
AD-614 330 DIV. 2
(AFOSR 4612)
AD-614 156 DIV. 2

•NONR219600
WOODS HOLE OCEANOGRAPHIC INSTI
TUTION MASS
REF 65 19
AD-614 097 DIV. 2

•NONR22041
HYDRODYNAMICS LAB CALIF INST
OF TECH PASADENA
E 111.4
AD-613 973 DIV. 9

•NONR22047
CALIFORNIA INST OF TECH PASADENA
AD-614 204 DIV. 20
AD-614 205 DIV. 20
AD-614 323 DIV. 2

•NONR221626
CALIFORNIA UNIV LA JOLLA
AD-614 436 DIV. 15

•NONR22253 GRANT
ELECTRONICS RESEARCH LAB UNIV
OF CALIFORNIA BERKELEY
(AROD 362:66)
AD-613 917 DIV. 15

•NONR22282
CALIFORNIA UNIV BERKELEY
SCHOOL OF OPTOMETRY
TR 6
AD-614 178 DIV. 16

•NONR22534
STANFORD UNIV CALIF DEPT
OF MATERIALS SCIENCE
TR 16 SU DMS 65 13
AD-613 970 DIV. 17
TR 15
AD-613 971 DIV. 17
TR 14
AD-614 080 DIV. 17

•NONR22548
MICROWAVE LAB STANFORD UNIV
CALIF
ML 1316
AD-614 099 DIV. 25
ML 1275
AD-614 045 DIV. 8

•NONR22550
INSTITUTE FOR MATHEMATICAL
STUDIES IN TH
TR 132
AD-614 252 DIV. 32

•NONR22553
OPERATIONS RESEARCH CENTER
UNIV OF CALIF BERKELEY
MS 29
AD-614 490 DIV. 15
STANFORD UNIV CALIF
TR 80
AD-614 271 DIV. 15

•NONR22817
UNIVERSITY OF SOUTHERN CALIFORNIA
LOS ANGELES
AD-614 331 DIV. 2

•NONR22826
CALIFORNIA UNIV LOS ANGELES
USC GEOL 65 1
F AD-614 437 DIV. 2

•NONR229601
MISSOURI UNIV COLUMBIA
TR 29
AD-614 326 DIV. 25

•NONR229603
MISSOURI SCHOOL OF MINES AND
METALLURGY ROLLA
TR 12
AD-614 183 DIV. 4

•NONR23336 GRANT
CALIFORNIA UNIV LOS ANGELES
AD-614 185 DIV. 16

•NONR23375
CALIFORNIA UNIV LOS ANGELES
WP 71
AD-614 064 DIV. 15

•NONR258706
MICHIGAN STATE UNIV EAST
LANSING DEPT OF BIOPHYSICS
AD-614 440 DIV. 16

•NONR260000

MANLABS INC CAMBRIDGE MASS
TR 9
AD-614 009 DIV. 17

•NONR26655 GRANT
COLUMBIA UNIV NEW YORK SCHOOL OF ENGINEERING AND APPLIED SCIENCE
TR 27
AD-614 120 DIV. 26

•NONR307700
AMERICAN INST FOR RESEARCH PALO ALTO CALIF
AD-614 316 DIV. 23
AD-614 317 DIV. 23

•NONR310400
INDIANA UNIV BLOOMINGTON DEPT OF CHEMISTRY
AD-614 218 DIV. 16
AD-614 313 DIV. 16
AD-614 314 DIV. 16

•NONR347000X
MICROWAVE ELECTRONICS CORP PALO ALTO CALIF
AD-614 222 DIV. 8
AD-614 469 DIV. 8
AD-614 470 DIV. 8

•NONR348400
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
REF 65 1
AD-614 011 DIV. 31
REF. 65 11
AD-614 453 DIV. 30

•NONR368618
OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY
MS 29
AD-614 490 DIV. 15

•NONR374801
HAWAII INST OF GEOPHYSICS HONOLULU
HIG 65 5
AD-614 273 DIV. 2

•NONR383500
AMERICAN OPTICAL CO SOUTHBRIDGE MASS
AD-613 963 DIV. 25

•NONR389705
DARTMOUTH COLL HANOVER N H
AD-614 147 DIV. 28

•NONR39613
NARRAGANSETT MARINE LAB UNIV OF RHODE ISLAND KINGSTON
REF 65 1
AD-614 546 DIV. 2

•NONR396303
FLUID DYNAMICS RESEARCH LAB MASS INST OF TECH CAMBRIDGE
65 1
(AFOSR 65-0192)
AD-614 230 DIV. 9

•NONR40138
CORNELL UNIV ITHACA N Y
TR 4
AD-614 254 DIV. 25

•NONR40147
CORNELL UNIV ITHACA N Y
TR 1 MSC 322
AD-614 487 DIV. 25

•NONR402900
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
REF 65 4
AD-614 071 DIV. 31

•NONR404300
LABORATORY OF CLIMATOLOGY C W THORNTHWAITE ASSOCIATES CENTERTON N J
TR 2
AD-614 189 DIV. 2

•NONR405400
TRACOR INC AUSTIN TEX
TRACOR 65 172 U
AD-614 098 DIV. 4

•NONR407600
HONEYWELL RESEARCH CENTER HOPKINS MINN
TR 28 HR 65 256
AD-614 054 DIV. 25

•NONR422201
CENTRAL RADIO PROPAGATION LAB NATIONAL BUREAU OF STANDARDS BOULDER COLO
AD-614 552 DIV. 25
CALIFORNIA UNIV SANTA BARBARA
TR 6
AD-614 324 DIV. 25
TR 7
AD-614 325 DIV. 25

•NONR429200
PHILCO CORP WILLOW GROVE PA BIO-CYBERNETICS LAB 2386
AD-613 930 DIV. 30

•NONR433600
DELAWARE UNIV NEWARK DEPT OF PHYSICS
AD-614 439 DIV. 25

•NONR457200
PERKIN-ELMER CORP NORWALK CONN ELECTRO-OPTICAL DIV
PE TR 7776
AD-613 968 DIV. 25

•NONR461600
AIRTRON INC MORRIS PLAINS N J
R11 473
AD-614 229 DIV. 14

•NONR47710
WASHINGTON UNIV SEATTLE
TR 108
AD-614 327 DIV. 2
TR 111
AD-614 454 DIV. 2
TR 110
AD-614 455 DIV. 2
TR 112
AD-614 456 DIV. 2

•NONR47737
WASHINGTON UNIV SEATTLE
TR 111
AD-614 454 DIV. 2
TR 110
AD-614 455 DIV. 2
TR 112
AD-614 456 DIV. 2

•NONR49919
TUFTS UNIV MEDFORD MASS
AD-613 933 DIV. 25

•NONR55118 GRANT
PENNSYLVANIA UNIV PHILADELPHIA SCHOOL OF MEDICINE
AD-614 561 DIV. 16

•NONR55157 GRANT
PENNSYLVANIA UNIV PHILADELPHIA
AD-613 926 DIV. 15
AD-613 927 DIV. 15

•NONR71031
MINNESOTA UNIV MINNEAPOLIS
TR 53
AD-614 131 DIV. 15

•NONR76024
CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION
MSRR 25
AD-614 121 DIV. 15

•NONR81613
WASHINGTON UNIV ST LOUIS MO SCHOOL OF MEDICINE
AD-614 148 DIV. 16

•NONR82917FBM
POLYTECHNIC INST OF BROOKLYN N Y
PIBAL 901
AD-614 072 DIV. 13

•NONR85507 GRANT
NORTH CAROLINA UNIV CHAPEL HILL
(AFOSR 65 0481)
AD-614 166 DIV. 25

•NONR90815
INDIANA UNIV BLOOMINGTON
AD-614 532 DIV. 28

•NORD7386
APPLIED PHYSICS LAB JOHNS HOPKINS UNIV SILVER SPRING MD
(NAVORD 1488 V5)
AD-613 972 DIV. 9

•NOW61 0905C
AERONUTRONIC NEWPORT BEACH CALIF
U 1751
AD-614 563 DIV. 10

•NOW64 0180C
PRESSURE TECHNOLOGY CORP OF AMERICA WOODBRIDGE N J
AD-613 969 DIV. 17
AD-614 086 DIV. 17
AD-614 128 DIV. 17
AD-614 129 DIV. 17
(N64 32652)
AD-614 236 DIV. 17

•NOW64 0568D
MELPAR INC FALLS CHURCH VA
AD-614 471 DIV. 7

•NOW65 0123D3
ORDNANCE RESEARCH LAB PENNSYLVANIA STATE UNIV UNIVERSITY PARK
AD-614 264 DIV. 25

•NRC A1080
SASKATCHEWAN UNIV SASKATOON
AD-614 535 DIV. 26

•NRC1252
WATERLOO UNIV (ONTARIO)
AD-614 358 DIV. 25

•NSF GP1193
BROOKHAVEN NATIONAL LAB UPTON N Y
(AFOSR 65-0506)
AD-614 176 DIV. 20
MARYLAND UNIV COLLEGE PARK
(AFOSR 65-0507)
AD-614 181 DIV. 20

•NSF GP1604
PENNSYLVANIA UNIV PHILADELPHIA
AD-613 926 DIV. 15
AD-613 928 DIV. 15

•NSF GP2202
COLUMBIA UNIV NEW YORK SCHOOL OF ENGINEERING AND APPLIED SCIENCE
TR 27
AD-614 120 DIV. 26

•NSF GP2495
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
432
AD-614 483 DIV. 15

•NSF GP4059
PENNSYLVANIA UNIV PHILADELPHIA
AD-613 927 DIV. 15
AD-613 928 DIV. 15

•NSF G10695
SEATTLE PACIFIC COLL WASH
INST FOR RESEARCH
AD-614 949 DIV. 20

•NSF G11309
PITTSBURGH UNIV PA DEPT
OF SOCIOLOGY
AD-614 986 DIV. 18

•NSF G17208
NORTH CAROLINA UNIV CHAPEL
HILL
AD-614 985 DIV. 25

•NSF G17430
KANSAS STATE UNIV MANHATTAN
(AFOSR 65-0537)
AD-614 491 DIV. 4

•NSF G19662
CHICAGO UNIV ILL
(AROD 2160:16)
AD-614 157 DIV. 15

•NSF G19728
LABORATORY FOR NUCLEAR SCIENCE
MASS INST OF TECH CAMBRIDGE
AD-614 981 DIV. 2

•NSF G21326 CONTRACT
WASHINGTON UNIV SEATTLE
TR 108
AD-614 927 DIV. 2

•NSF G9330
RESEARCH LAB OF ELECTRONICS
MASS INST OF TECH CAMBRIDGE
AD-614 984 DIV. 25

•NS6232 62
IOWA STATE UNIV IOWA CITY
65 7
AD-614 100 DIV. 2

•NS6275 62
THEORETICAL CHEMISTRY INST
UNIV OF WISCONSIN MADISON
AD-614 979 DIV. 25
AD-614 980 DIV. 25

•NS640 60
GRADUATE AERONAUTICAL LABS
CALIF INST OF TECH PASADENA
AD-614 978 DIV. 25

•N140 131 730988
ALLOYD GENERAL CORP CAMBRIDGE
MASS
AD-613 931 DIV. 17

•N60NR26916
CRYSTAL RESEARCH LAB PENNSYLVANIA
STATE UNIV UNIVERSITY PARK
AD-613 925 DIV. 30

•N60921 7094
NARMCO RESEARCH AND DEVELOPMENT
DIV WHITTAKER CORP SAN
DIEGO CALIF
AD-613 997 DIV. 14

•N62858 4297
QUEEN'S UNIV BELFAST (NORTHERN
IRELAND) DEPT OF APPLIED
MATHEMATICS
AD-613 929 DIV. 20

•N90NR93806
IOWA STATE UNIV IOWA CITY
65 8
AD-614 101 DIV. 2

•OCD PS64 61 GRANT
PITTSBURGH UNIV PA DEPT
OF SOCIOLOGY
AD-614 986 DIV. 18

•OE2 10 007
PITTSBURGH UNIV PA
(AMRL TR-64-129)
AD-614 014 DIV. 28

•PHS AM3035
CALIFORNIA UNIV LOS ANGELES
AD-614 185 DIV. 16

•PHS DE01377 02
NAVAL MEDICAL RESEARCH INST
BETHESDA MD
MR 005.12 5000.02 R 10
AD-614 210 DIV. 16
MR 005.12 5000.02
AD-614 211 DIV. 16

•PHS FR00118 01A1
CENTER FOR DOCUMENTATION AND
COMMUNICATION RESEARCH WESTERN
RESERVE UNIV CLEVELAND
CSL TR 2
(AFOSR 65-0587)
AD-614 005 DIV. 22

•PHS HE07762
PENNSYLVANIA UNIV PHILADELPHIA
SCHOOL OF MEDICINE
AD-614 961 DIV. 16

•PHS 2A9289C2
TEMPLE UNIV PHILADELPHIA
PA SCHOOL OF MEDICINE
AD-614 353 DIV. 16

•1P6 22001A057
ARMY ELECTRONICS COMMAND FORT
MONMOUTH N J
ECOM 2510
AD-614 027 DIV. 8

•6X61 01 001 03
ARMED FORCES INST OF PATHOLOGY
ARMY MEDICAL CENTER WASHINGTON
D C
AD-614 179 DIV. 16

•PROJS.
MIDWEST RESEARCH INST KANSAS
CITY MO
AD-614 473 DIV. 4

•SD79
RAND CORP SANTA MONICA CALIF
RM 4368 ARPA
AD-614 420 DIV. 25

AD-DIVISION INDEX

613 914	2
613 915	9
613 916	9
613 917	15
613 918	16
613 919	8
613 920	4
613 921	4
613 922	4
613 923	4
613 924	4
613 925	30
613 926	15
613 927	15
613 928	15
613 929	20
613 930	30
613 931	17
613 932	8
613 933	25
613 934	20
613 935	22
613 936	14
613 937	22
613 938	2
613 939	9
613 940	13
613 941	19
613 942	24
613 943	20
613 944	5
613 945	4
613 946	30
613 947	8
613 948	8
613 949	28
613 950	29
613 951	8
613 952	17
613 953	8
613 954	28
613 955	1
613 956	2
613 957	17
613 958	12
613 959	7
613 960	8
613 961	25
613 962	27
613 963	25
613 964	5
613 965	2
613 966	30
613 967	25
613 968	25
613 969	17
613 970	17
613 971	17
613 972	9
613 973	9
613 974	15
613 975	32
613 976	30
613 977	25
613 978	2
613 979	2
613 980	25
613 981	2
613 982	2
613 983	30
613 984	25
613 985	25
613 986	25
613 987	13
613 988	2
613 989	4
613 990	15
613 991	2
613 992	27
613 993	20
613 994	8
613 995	8
613 996	25
613 997	14
613 998	21
613 999	8
614 000	8
614 001	8
614 002	12
614 003	12
614 004	9
614 005	32
614 006	30
614 007	25
614 008	9
614 009	17
614 010	30
614 011	31
614 012	2
614 013	6
614 014	28
614 015	25
614 016	1
614 017	17
614 018	2
614 019	17
614 020	30
614 021	2
614 022	30
614 023	20
614 024	16
614 025	32
614 026	25
614 027	8
614 028	31
614 029	25
614 030	30
614 031	25
614 032	30
614 033	30
614 034	30
614 035	8
614 036	8
614 037	20
614 038	25
614 039	25
614 040	15
614 041	4
614 042	30
614 043	2
614 044	25
614 045	8
614 046	8
614 047	8
614 048	6
614 049	25
614 050	25
614 051	25
614 052	25
614 053	25
614 054	25
614 055	8
614 056	2
614 057	18
614 058	7
614 059	14
614 060	1
614 061	25
614 062	25
614 063	25
614 064	15
614 065	1
614 066	32
614 067	9
614 068	16
614 069	8
614 070	15
614 071	31
614 072	13
614 073	30
614 074	8
614 075	8
614 076	14
614 077	4
614 078	8
614 079	2
614 080	17
614 081	25
614 082	25
614 083	4
614 084	8
614 085	2
614 086	17
614 087	20
614 088	25
614 089	20
614 090	8
614 091	25
614 092	8
614 093	32
614 094	27
614 095	30
614 096	30
614 097	2
614 098	4
614 099	25
614 100	2
614 101	2
614 102	30
614 103	8
614 104	7
614 105	2
614 106	2
614 107	2
614 108	13
614 109	16
614 110	8
614 111	27
614 112	8
614 113	26
614 114	31
614 115	17
614 116	8
614 117	2
614 118	8
614 119	7
614 120	26
614 121	15
614 122	8
614 123	8
614 124	8
614 125	8
614 126	31
614 127	26
614 128	17
614 129	17
614 130	30
614 131	15
614 132	25
614 133	10
614 134	28
614 135	2
614 136	25
614 137	25
614 138	1
614 139	9
614 140	9
614 141	8
614 142	25
614 143	20
614 144	20
614 145	20
614 146	16
614 147	28
614 148	16
614 149	25
614 150	20
614 151	20
614 152	20
614 153	20
614 154	20
614 155	2
614 156	2
614 157	15
614 158	15
614 159	9
614 160	2
614 161	2
614 162	19
614 163	25
614 164	30
614 165	25
614 166	25
614 167	20
614 168	2
614 169	2
614 170	2
614 171	20
614 172	20
614 173	25
614 174	20
614 175	20
614 176	20
614 177	25
614 178	16
614 179	16
614 180	25
614 181	20
614 182	17
614 183	4
614 184	25
614 185	16
614 186	16
614 187	20
614 188	2
614 189	2

614 190	32
614 191	16
614 192	4
614 193	16
614 194	16
614 195	4
614 196	25
614 197	25
614 198	16
614 199	16
614 200	25
614 201	27
614 202	16
614 203	2
614 204	20
614 205	20
614 206	25
614 207	4
614 208	25
614 209	25
614 210	16
614 211	16
614 212	30
614 213	20
614 214	5
614 215	4
614 216	25
614 217	2
614 218	16
614 219	25
614 220	25
614 221	20
614 222	8
614 223	8
614 224	23
614 225	25
614 226	16
614 227	8
614 228	30
614 229	14
614 230	9
614 231	1
614 232	25
614 233	2
614 234	25
614 235	25
614 236	17
614 237	9
614 238	19
614 239	18
614 240	8
614 241	16
614 242	14
614 243	28
614 244	8
614 245	16
614 246	16
614 247	30
614 248	30
614 249	16
614 250	20
614 251	8
614 252	32
614 253	8
614 254	25
614 255	2
614 256	15
614 257	30
614 258	30
614 259	13
614 260	27
614 261	31
614 262	22
614 263	14
614 264	25
614 265	14
614 266	16
614 267	16
614 268	8
614 269	26
614 270	20
614 271	15
614 272	30
614 273	2
614 274	14
614 275	8
614 276	20
614 277	26
614 278	14
614 279	27
614 280	8
614 281	30
614 282	30
614 283	25
614 284	16
614 285	8
614 286	2
614 287	30
614 288	8
614 289	25
614 290	4
614 291	4
614 292	25
614 293	4
614 294	25
614 295	2
614 296	25
614 297	8
614 298	16
614 299	16
614 300	16
614 301	15
614 302	16
614 303	2
614 304	4
614 305	16
614 306	16
614 307	26
614 308	25
614 309	25
614 310	2
614 311	9
614 31[illegible]	25
614 31[illegible]	16
614 314	16
614 315	16
614 316	23
614 317	23
614 318	17
614 319	25
614 320	25
614 321	16
614 322	30
614 323	2
614 324	25
614 325	25
614 326	25
614 327	2
614 328	25
614 329	7
614 330	2
614 331	2
614 332	16
614 333	16
614 334	16
614 335	2
614 336	5
614 337	16
614 338	28
614 339	16
614 340	16
614 341	16
614 342	16
614 343	16
614 344	16
614 345	16
614 346	16
614 347	16
614 348	16
614 349	16
614 350	4
614 351	25
614 352	2
614 353	16
614 354	2
614 355	16
614 356	32
614 357	25
614 358	25
614 359	25
614 360	25
614 361	2
614 362	16
614 363	28
614 364	28
614 365	25
614 366	20
614 367	25
614 368	20
614 369	25
614 370	16
614 371	25
614 372	25
614 373	25
614 374	20
614 375	20
614 376	4
614 377	25
614 378	25
614 379	25
614 380	25
614 381	2
614 382	4
614 383	25
614 384	25
614 385	25
614 386	18
614 387	17
614 388	7
614 389	9
614 390	17
614 391	25
614 392	9
614 393	30
614 394	16
614 395	2
614 396	4
614 397	30
614 398	24
614 399	2
614 400	23
614 401	2
614 402	12
614 403	16
614 404	9
614 405	17
614 406	32
614 407	32
614 408	26
614 409	2
614 410	12
614 411	2
614 412	15
614 413	30
614 414	6
614 415	8
614 416	5
614 417	30
614 418	13
614 419	15
614 420	25
614 421	31
614 422	17
614 423	18
614 424	30
614 425	8
614 426	8
614 427	2
614 428	2
614 429	9
614 430	13
614 431	33
614 432	20
614 433	8
614 434	8
614 435	25
614 436	15
614 437	2
614 438	32
614 439	25
614 440	16
614 441	2
614 442	25
614 443	19
614 444	9
614 445	25
614 446	8
614 447	17
614 448	8
614 449	28
614 450	26
614 451	20
614 452	20
614 453	30
614 454	2
614 455	2
614 456	2
614 457	9
614 458	25
614 459	8
614 460	1
614 461	25
614 462	17
614 463	25
614 464	17
614 465	17

614 466	17
614 467	26
614 468	8
614 469	8
614 470	8
614 471	7
614 472	14
614 473	4
614 474	18
614 475	2
614 476	4
614 477	6
614 478	16
614 479	16
614 480	8
614 481	13
614 482	25
614 483	15
614 484	10
614 485	25
614 486	16
614 487	25
614 488	13
614 489	30
614 490	15
614 491	4
614 492	9
614 493	20
614 494	25
614 495	25
614 496	20
614 497	25

614 498	4
614 499	14
614 500	4
614 501	17
614 502	4
614 503	25
614 504	25
614 505	4
614 506	17
614 507	20
614 508	16
614 509	4
614 510	16
614 511	16
614 512	16
614 513	4
614 514	16
614 515	20
614 516	4
614 517	4
614 518	4
614 519	17
614 520	25
614 521	16
614 522	16
614 523	2
614 524	4
614 525	8
614 526	15
614 527	25
614 528	15
614 529	25
614 530	4

614 531	25
614 532	28
614 533	25
614 534	25
614 535	26
614 536	2
614 537	20
614 538	4
614 539	20
614 540	4
614 541	25
614 542	25
614 543	15
614 544	4
614 545	25
614 546	2
614 547	4
614 548	4
614 549	20
614 550	25
614 551	4
614 552	25
614 553	25
614 554	8
614 555	4
614 556	17
614 557	25
614 558	25
614 559	15
614 560	8
614 561	16
614 562	28
614 563	10

OTHER RESEARCH REPORTS AND RELATED MATERIAL

*Descriptors marked with an asterisk are included in the subject index

1. Aircraft and Flight Equipment

No Entries

2. Astronomy, Geophysics and Geography

Patent 3,174,128 Div. 2, 30

COMBINED DEPTH MONITORING AND SEISMIC SURVEYING APPARATUS.
Patent assigned to Navy,
by Willard Dow and Stephen L. Stillman, Jr.
16 Mar 65
Unclassified patent
Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Depth finding, Oceanographic equipment), (*Oceanographic equipment, Depth finding), Monitors, Seismology, Ocean bottom, Recording systems, Patents.

The apparatus includes an echo sounder which is lowered into the water from a surface vessel. The echo sounder is maintained and stabilized in an inverted position with its main lobe and minor lobe both similarly oriented with respect to the ocean floor. Signals are recorded on a recording strip. The record enables an operator to determine the instruments position with reference to the ocean floor and indicates the depth of the water.

Patent 3,175,459 Div. 2

METER FOR OPTICALLY MEASURING FLUID CURRENT VELOCITY.
Patent assigned to Interior,
by Winchell Smith and Glen F. Bailey. 30 Mar 65
Unclassified patent
Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Flowmeters, Hydrology), River currents, Velocity, Stroboscopes, Surface properties, Rivers, Patents.

The meter measures the velocity of the flow or current in a stream or channel of a river. The instrument is in the form of a stroboscopically operated mechanism. An instantaneous measure of the surface velocity of a stream is obtained by direct observation of the water surface from a point above the stream or river.

PB-167 118 Div. 2, 13, 31
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., Schenectady, N. Y. Advanced Technology Labs.

EXTENSION OF MOHOLE PLATFORM FORCE AND MOTION STUDIES,
by J. A. Bain. 21 Oct 64, 39p
Contract NSF C260
Unclassified report

Prepared on subcontract to Brown & Root, Inc., Houston, Tex.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Hulls (Marine), Well logging), (*Floating bodies, Drilling machines), Pitch (Motion), Roll, Yaw, Force (Mechanics), Mathematical analysis, Graphics, Water waves, Stability, Motion, Marine geology.

As a result of studies of the MOHOLE platform, it appears likely that dimensions, weights, and operating draft will be revised from those studied in the previous report MOHOLE platform force and motion. Interest in this revised platform required its analysis by the refined techniques discussed in the first report and this is the reporting of those studies. The problem is to find the 6 oscillating components of rigid body motion and the 18 components of force exerted by the sea on the platform when the platform is immersed in regular sinusoidal waves. The method of analysis is exactly the same as reported in December, 1963, and the reader may refer there to answer questions concerning the technique or specific equations. The assumptions and simplifications are the same in this report as in the previous one except, in this study, the column diameters were considered to be larger than their actual value so as to approximate the effects of the braces.

PB-167 119 Div. 2, 13, 26
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., Schenectady, N. Y.
Advanced Technology Labs.
MOHOLE PLATFORM: NATURAL FREQUENCY, MODAL MASS, AND DYNAMIC STRESS STUDIES (IN THREE SECTIONS),
by R. M. Mains. 20 Jan 64, 29p
Contract NSF C260
Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Available copy will not permit fully legible reproduction.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Drilling machinery, Floating bodies), (*Floating bodies, Drilling machines), Mathematical models, Frequency, Cantilever beams, Vibration, Water waves, Loading (Mechanics), Tensile properties, Stresses, Ships, Marine geology.

Contents:
Dimensions, data, and method of compilation used for the stiffness matrix for the platform that was used to calculate the natural frequencies and stresses
Computation of natural frequencies for the platform, the modal mass for each natural mode, and the wave energy spectrum, showing no difficulty should be expected from resonant vibration of the platform caused by wave action
Stresses calculated for one static and 6 dynamic load cases.

PB-167 120 Div. 2, 13, 15, 31
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., Schenectady, N. Y.
MOHOLE PLATFORM: COEFFICIENT OF THE EQUATIONS OF MOTION (LIGHT DRAFT CASE).
Technical information series,
by A. R. Crocker, W. H. Harker, R. J. Maier, J. L. Mulligan, and W. J. Patterson. 15 Dec 63, 69p
Rept. no. R64-ELS-8 Unclassified report
Contract NSF C260

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Available copy will not permit fully legible reproduction.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Ships, Motion), (*Differential equations, Motion), Ocean waves, Nonlinear systems, Oscillation, Hulls (Marine), Drag, Resonance, Marine geology, Drilling machines, Floating bodies.

The MOHOLE platform is designed to operate in two modes, deep draft when drilling and light draft when moving. The coefficients of the coupled equations of motion for the light draft mode in a head sea are derived. The method used is essentially that developed by Korvin-Kroukovsky, with some modification. In order to best approximate the behavior of the platform, two sets of coefficients are derived. The first is for the case where the mass of the platform is taken as the mass of water displaced by two half submerged cylinders which have the same radius as the hulls of the real platform. The second case is where equivalent radius is calculated so that the mass of water displaced by half submerged cylinders of this radius is equal to the mass of the platform. (Author)

PB-167 121 Div. 2, 13, 31
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., Schenectady, N. Y. Advanced Technology Labs.
MOHOLE PLATFORM STUDIES.
Interim rept.
24 Aug 63, 29p Unclassified report
Contract NSF C260
Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
ARept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Ships, Well logging), (*Floating bodies, Drilling machines), Hulls (Marine), Stability, Motion, Configuration, Drag, Frequency, Stresses, Hydrodynamics, Marine geology.

The purpose of these calculations was to obtain the natural frequencies of the MOHOLE vessel taken as a free-floating elastic structure. From these natural frequencies one can make qualitative judgements about the dynamic stresses imposed by oscillating loads. The determination of these frequencies (and associated natural modes) is also a first step toward a quantitative determination of dynamic stresses. The stiffness matrix, which must be found to determine natural frequencies and modes, is also a valuable tool for the determination of stresses imposed either by dynamic or static loads.

PB-167 122 Div. 2, 13, 15, 31
CFSTI Prices: HC$3.00 MF$0.50

General Electric Co. Schenectady, N. Y. Advanced Technology Labs.
SIMPLIFIED MOTION EQUATIONS FOR MOHOLE PLATFORM,
by J. Bain. 16 Aug 63, 52p Rept. no. 63GL121
Contract NSF C260
Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Rept. on Proj. Mohole.
Available copy will not permit fully legible reproduction.
See also AD-167 123.

Descriptors: (*Well logging, Feasibility studies), (*Ships, Motion), (*Differential equations, Motion), Ocean waves, Simulation, Analog systems, Oscillation, Damping, Roll, Pitch (Motion), Yaw, Marine geology, Drilling machines, Floating bodies.

The report documents the equations of motion used in the analog simulation of the Mohole platform. It is issued at this time, in advance of a complete report, so that it may serve as a working document for those actively engaged in the program. These equations are simplified versions of those now being used in the Dynasar solution of this problem. (Author)

PB-167 123 Div. 2, 13, 15, 31
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., Schenectady, N. Y. Advanced Technology Labs.
MOHOLE PLATFORM EQUATIONS OF MOTION FOR DYNASAR PROGRAM.
Technical information series,
by J. Bain. 21 Aug 63, 34p Rept. no. 63GL122
Contract NSF C260
Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Ships, Motion), (*Differential equations, Motion), Ocean waves, Oscillation, Analog systems, Simulation, Force (Mechanics), Moments, Roll, Pitch (Motion), Integrals, Marine geology, Drilling machines, Floating bodies.

The report documents the equations of motion used in the Dynasar simulation of the Mohole platform motions. It is issued at this time, in advance of the complete report, so that it may serve as a working document for those actively engaged in the program. (Author)

PB-167 124 Div. 2, 13, 17
CFSTI Prices: HC$2.00 MF$0.50

Bttelle Memorial Inst., Columbus, Ohio.
A STUDY OF FATIGUE AND OTHER RELATED PROBLEMS ASSOCIATED WITH DRILL PIPE AND CASING MATERIALS FOR PROJECT MOHOLE.
Summary rept.,
by Arnold E. Schuetz, Walter S. Hyler, Lloyd R. Jackson, and Walter K. Boyd. 28 Feb 64, 41p
Contract NSF C260
Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
See also PB-167 125.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Fatigue (Mechanics)), (*Steel, Pipes), Heat treatment,

Corrosion, Environment tests, Stresses, High-temperature research, High-pressure research, Shock resistance, Impact shock, Fracture (Mechanics), Toughness, Life expectancy, Sea water.

The results of a preliminary study to evaluate materials for the drill string to be used in Project Mohole are presented in this report. Most of the evaluation was made on high-strength S-135 heat-treated drill pipe; but some comparative testing also was made on the more common Grade E steel pipe. Studies were carried out concerned with fatigue strength in air, corrosion fatigue in sea water, stress-corrosion cracking at high temperature and pressure, and with impact strength. The fatigue strength of S-135 steel was generally higher than that of Grade E steel; however, with the higher notch sensitivity of the S-135 steel, its notched alternating stress limit was the same as that for the Grade E steel. As expected, fatigue strengths of the steels were reduced in the sea water environment. Thus, a critical problem exists in controlling corrosion fatigue of the drill string. Fortunately, no susceptibility to stress-corrosion cracking in sea water at 2200-psi pressure at 650 F was found for either steel. Impact strength of the S-135 steel appears to be marginal and to require improvement. Possibilities of combating the two critical conditions--corrosion fatigue and fracture toughness--are discussed. (Author)

PB-167 125 Div. 2, 13, 17
CFSTI Prices: HC$4.00 MF$1.00

Battelle Memorial Inst., Columbus, Ohio.
A STUDY OF FATIGUE AND OTHER RELATED PROBLEMS ASSOCIATED WITH DRILL PIPE AND CASING MATERIALS FOR PROJECT MOHOLE.
Summary rept. no. 2,
by David W. Hoeppner, Thomas P. Groeneveld, Arthur C. Koppenhafer, Walter S. Hyler, and Arthur R. Elsea.
6 Nov 64, 134p
Contract NSF C260

Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
See also PB-167 124.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Fatigue (Mechanics)), (*Steel, Pipes), (*Corrosive inhibition, Pipes), Corrosion, Metal coatings, Cathodic protection, Zinc coatings, Hydrogen embrittlement, Fracture (Mechanics), Sea water, Toughness, Environmental tests.

Included in these studies were experiments on effects of cathodic protection and sacrificial metal coatings to minimize the corrosion fatigue problem, evaluation of potential problems that may arise from hydrogen that can permeate the drill pipe with the use of such protection systems, establishment of specification requirements for impact characteristics of the drill pipe steel, evaluation of the crack propagation and residual strength of the 135 type steel. The corrosion fatigue strength of 135 type steel in sea water can be improved by the use of cathodic protection and with the use of a sacrificial zinc coating. However, with both protection systems hydrogen will be released at the drill pipe. Experiments showed that the 135 type steel is susceptible to hydrogen-induced delayed fracture, if the hydrogen enters the steel. However, experiments in sea water have not resulted in any failures; hence, this appears only as a potential problem. On the basis of Charpy tests and drop weight tear test results, recommendations are made for the steel drill pipe specification for impact strength. Crack propagation studies have shown that rates are high at certain of the stress levels evaluated. (Author)

PB-167 126 Div. 2, 14, 17
CFSTI Prices: HC$2.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
CORROSION IN DEEP-OCEAN AND RELATED ENVIRONMENTS.
State-of-the art rept.,
by Walter K. Boyd. 14 May 64, 28p
Contract NSF C260

Unclassified report

Prepared on Subcontract to Brown and Root, Inc., Houston, Tex.

Descriptors: (*Well logging, Feasibility studies), (*Corrosion, Sea water), (*Paints, Corrosion inhibition), Protective coverings, Metals, Zinc, Aluminum, Antifouling coating, Fouling, Physical properties, Oceans, Reviews, Coatings.

Steps are being taken toward drilling a hole entirely through the earth's crust. Since the earth's crust is thinnest below the ocean floor (3 miles as compared with 30 miles under land), plans are to drill Mohole from a floating platform over a deep-ocean trench. This deep-sea drilling presents a number of severe problems, not the least of which is corrosion. The corrosiveness of sea water is well known. It attacks carbon and low-alloy steels, which are the conventional drill string and casing materials employed in almost all drilling operations. The problem of corrosion not only includes attack by the sea at shallow depths, but that occurring in the relatively unexplored deep-ocean environment. Since the drill string and casing will be exposed to the corrosive effects of sea water from the surface to approximately 20,000 feet, it will be necessary to know that the chosen materials and corrosion preventive treatments are suitable at all depths. The selection of materials and corrosion-preventive measures is the subject of this state-of-the-art report.

PB-167 127 Div. 2, 13
CFSTI Prices: HC$3.00 MF$0.75

National Engineering Science Co., Pasadena, Calif.
DYNAMIC STRESS ANALYSIS OF THE MOHOLE RISER SYSTEM.
Final rept. for Apr-Dec 64.
29 Dec 64, 89p Rept. no. SN-183-2
Contract NSF C260

Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Stresses), Drag, Loading (Mechanics), Hydrodynamics, Ocean waves, Ocean currents, Buoys, Mathematical analysis, Design.

Methods for analyzing the motions and stresses in a very long beam under tension, with varying properties and loading along the length and with time variable boundary conditions, were developed and were applied to the feasibility investigation of a marine conductor for the Mohole. The analysis included several factors that have been omitted for simplicity in studies of similar structures made by previous investigators. In particular, the following were included: (a) Flexural rigidity along the entire length of the beam; (b) Square-law damping, with drag coefficients functions of local Reynolds number; (c) Wave excitations; (d) Three-dimensional excitations and motions. The principal result of the analysis was a riser design capable of withstanding the anticipated environment during the extended period of time that the Mohole drilling may require. Recommendations for studies to refine and optimize the design are included. (Author)

PB-167 128 Div. 2
CFSTI Prices: HC$2.00 MF$0.50

National Engineering Science Co., Washington, D. C.
DESIGN SEA STATE STUDY. PROJECT MOHOLE.
Final rept.,
by C. L. Bretschneider and J. I. Collins. 6 Jun 64,
43p Rept. no. SN-187
Contract NSF C260

Unclassified report

Prepared on subcontract to Brown and Root, Inc.,
Houston, Tex.

Descriptors: (*Well logging, Feasibility studies), (*Tropical cyclones, Weather forecasting), (*Weather forecasting, Marine meteorology), Atlantic Oceans, Surface properties, Ocean waves, Hurricane tracking, Oceanology.

Detailed knowledge of the expected sea state is required for the design and operation of the Mohole drilling platform. One of the requirements is an estimate of the maximum expected sea conditions so that survival of the drilling platform can be assured. The purpose of this study is to predict the maximum sea state for the North Atlantic hurridane belt between the equator and 30 degrees N. latitude. Other areas of the world where this sea state can be equalled or exceeded will be indicated.

PB-167 129 Div. 2, 8
CFSTI Prices: HC$4.00 MF$0.75

General Motors Corp., Santa Barbara, Calif.
PLATFORM ELECTRONICS FOR A SHORT BASELINE ACOUSTIC POSITION MEASUREMENT SYSTEM (IN FIVE PARTS).
Interim rept.
1964, 102p
Contract NSF C260

Unclassified report

Prepared on subcontract to Brown and Root, Inc.,
Houston, Tex.

Descriptors: (*Well logging, Feasibility studies), (*Hydrophones, Circuits), (*Electronic equipment, Hydrophones), (*Acoustic equipment, Design), Sound signals, Signal generators, Sonar receivers, Sound ranging, Analog systems, Digital systems, Digital-to-analog systems, Transducers, Transponders, Amplifiers, Electric filters, Attenuators, Computers, Specifications.

The report was prepared to consolidate the detail design of platform electronics for a short baseline acoustic position measurement system. The design is suitable for use with a variety of insitu geometries using either passive reflectors, transponders or ocean floor arrays. The platform electronics complement divides into four general areas; that of signal generation and reception, signal processing, range computation and coordinate generation. The first two areas make use of analog circuitry, i.e., amplifiers, filters, etc., whereas the latter two areas are composed primarily of digital equipment. The discussion will treat each area individually, prefaced by a general system description and followed by the equipment installation requirements. (Author)

PB-167 130 Div. 2, 13, 26
CFSTI Prices: HC$1.00 MF$0.50

AMF Tuboscope, Inc., Houston, Tex.

INSPECTION OF GRADE S-135 DRILL PIPE TEST SAMPLES FOR MOHOLE PROJECT,
by H. J. Schneider, F. M. Wood, and W. M. Rogers.
7 Apr 64, 20p Unclassified report
Contract NSF C260

Prepared on subcontract to Brown and Root, Inc.,
Houston, Tex.
Rept. on proj. Mohole.
Available copy will not permit fully legible reproduction.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Well logging), Errors, Tests, Failure (Mechanics), Fracture (Mechanics), Couplings, Disconnect fittings, Stresses, Drilling machines, Floating bodies, Quality control, Marine geology.

The report indicates that considerably more significance is placed upon the existance of any flaw as its location approaches the tube ends, and that flaws heretofore considered as being non-injurious may be intolerable on the ends of high strength drill pipe. As pointed out earlier, what appears to be rather insignificant flaws located near the tube ends apparently did influence failure location while considerably more injurious flaws located further from the tube end did not. This would indicate that in drill pipe to be used on the Mohole Project, extreme caution should be exercised to obtain pipe free of all stress risers in the end areas, and that care must be exercised during drilling operations to maintain this condition.

PB-167 131 Div. 2, 13, 26
CFSTI Prices: HC$1.00 MF$0.50

Brown and Root, Inc., Houston, Texas.
SPECTROSCOPIC ANALYSIS OF TRACER MATERIALS IN DRILLING FLUID.
Technical rept.,
by W. F. Walker. 4 Nov 63, 15p Unclassified report
Contract NSF C260

Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Tracer studies, Well logging), Maintenance, Drilling machines, Drills, Wear resistance, Particles, Labeled substances, Spectroscopy, Floating bodies, Marine geology.

This report is prepared to acquaint all interested parties with the subject of spectroscopic analysis as it applies to the determination of wear of down-hole components without necessity of tripping out at frequent intervals. The suggestion was made to alloy, plate, or otherwise deposit tracer materials at points of wear, and analyse surface returns for the quantitative presence of these materials. The availability of a class of instruments having the required sensitivity was assured. Major work remains to be done in reviewing the effect of tripping, flow stoppage, and addition of lost circulation materials on the spot concentration of the tracers. In addition a sampling technique with minimum time lag and uniform efficiency must be developed, and required instrument specifications determined. Considerable efforts are being made to develop down-hole tools for increased life on bottom. In operation, the tools will not be run until completely worn, but a safety factor will be applied on a time, footage, or load basis. Tracer analysis will permit reducing that factor, and costs must be justified by the savings in tripping costs alone. (Author)

PB-167 132 Div. 2, 13, 17
CFSTI Prices: HC$4.00 MF$1.00

Hughes Tool Co., Houston, Tex. Oil Tool Div.

PHYSICAL TESTS ON KNIPPA BASALT AND PINK QUARTZITE CORES. GALLING, BUCK-UP AND MECHANICAL PROPERTIES TESTS ON TITANIUM ALLOY. FATIGUE AND METALLURGICAL TEST 41/2in I.U. 16.6 lb HIGH STRENGTH PIPE.
1964, 119p
Contract NSF C260

Unclassified report

Prepared on Subcontract to Brown and Root, Inc., Houston, Tex.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Titanium alloys, Performance (Engineering)), (*Couplings, Titanium alloys), (*Pipes, Steel), Basalt, Quartz, Tests, Bonding, Mechanical properties, Fatigue (Mechanics), Tensile properties, Microstructure, Fracture (Mechanics, Experimental data, Hardness.

Contents:
Physical tests on knippa basalt and pink quartzite cores
Galling, buck-up and mechanical properties tests on titanium alloy
Fatigue and metallurgical test 4 1/2 in I.U. 16.6 lb High Strength Pipe.

PB-167 133 Div. 2, 13, 14, 17
CFSTI Prices: HC$2.00 MF$0.50

Pan American Petroleum Corp., Tulsa, Okla.
INHIBITOR FOR AERATED SEA WATER. MOHOLE.
Final rept.,
by A. W. Garst. 3 Sep 64, 29p
Contract NSF C260

Unclassified report

Rept. on Inhibitor Research.
Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Corrosion inhibition), (*Corrosion inhibition, Materials), Sea water, Corrosion, Fatigue (Mechanics), Oils, Fatty acids, Polyamide plastics, Surface-active substances, Fuel oil, Drilling machines, Floating bodies, Marine geology.

The original test program designed to find at least one inhibitor effective in minimizing corrosion fatigue at temperatures of 200F, and 400F, was successfully completed. Inhibitors were screened by bending a test specimen back and forth while exposed to inhibited or uninhibited synthetic sea water. The specimen was bent back and forth at the rate of 50 cycles per minute with the maximum stress adjusted to approximately 90,000 psi. At 200F., only a soluble oil type sold as Weilmuenster 1210 Liquid Phase Concentrate was found effective in increasing the number of stress cycles required to break the specimen in air saturated sea water. An increase of approximately 75% was achieved with this compound. (Author)

PB-167 134 Div. 2, 13, 26
CFSTI Prices: HC$1.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
LINEAR LATCH DESIGN,
Technical rept.
Dec 63, 24p
Contract NSF C260

Unclassified report

Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Latches, Design), Marine geology, Drills, Drilling machines, Floating bodies.

PB-167 135 Div. 2, 13
CFSTI Prices: HC$2.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
CRYOGENIC NITROGEN BUOY ACTIVATION SYSTEM.
Feasibility rept.
25 Oct 63, 43p
Contract NSF C260

Unclassified report

Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Buoys, Feasibility studies), Nitrogen, Cryogenics, Storage, Barometric pressure, Welding, Drilling machines, Floating bodies, Marine geology.

To provide for activation of sea water displacement type buoys used to support part of the riser casing system load it is necessary to supply compressed air, or other gases, to the buoys from the rig floor. The requirements for buoyancy are variable and dependent upon the operating conditions. The amount of gas needed to produce the required buoyancy is a function of the amount of sea water to be displaced and the temperature and pressure of the gas causing the displacement. The gas temperature, if not initially at ambient in the vicinity of the buoys, will eventually equalize to this value; and the pressure is controlled by the depth (sea water head) at which the gas-water interface is located. The major requirement for sea water displacement buoyancy is a reserve for emergency conditions to permit suspension of the drill string within the riser casing if it should become necessary to move the drilling rig from the location quickly. For suspension of the maximum anticipated drill string length about 550 kips of buoyancy are needed. A feasibility study was performed to determine the prospects for storing the gas at cryogenic temperatures in the liquid state and at or near atmospheric pressure.

PB-167 136 Div. 2, 13, 30
CFSTI Prices: HC$2.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
MOHOLE ACOUSTIC NOISE TESTS, BLUEWATER RIG NO. 1.
Revised ed.,
by Paul M. Mettert. 18 Dec 63, 36p
Memorandum rept. no. SDL-3-0D6146
Contract NSF C260

Unclassified report

Rept. on Proj. Mohole.
Revision of rept. dated 9 Dec 63.
Available copy will not permit fully legible reproduction.

Descriptors: (*Well logging, Feasibility studies), (*Noise, Well logging), Hydrophones, Underwater sound, Noise analyzers, Drilling machines, Floating bodies, Marine geology.

Acoustic noise tests were conducted on the Bluewater Rig no. 1 in the Gulf of Mexico, 70 miles offshore from Grand Isle. Water depth was 280 feet. Noise measurements were made at six positions. During measurements at Position A, the rig was drilling the initial well. The remaining measurements were made during reaming operations, which consisted of increasing the hole size from about 10 inches to about 20 inches.

PB-167 137 Div. 2, 13
CFSTI Prices: HC$1.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
INITIAL BUOY TEST RESULTS, PROJECT MOHOLE,
by William Allen, Jr. 3 Mar 64, 12p
Memorandum rept. no. SDL-5-OD-6146
Contract NSF C260

Unclassified report

Available copy will not permit fully legible reproduction.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Buoys, Tests), Floats, Drag, Marine geology, Drilling machines, Floating bodies.

The initial portion of the buoy test program consisted of two test phases: (A) Surface float drag tests (B) Experimental test plant. Results of the drag tests indicate that the drag of the surface float is higher than indicated by the manufacturer by a factor of more than 2. Cause may be attributed to the chain ballast. The experimental test plant was successful in that satisfactory handling procedures evolved from the work. Unfortunately, the entire buoy assembly was lost during the night due to unknown causes.

PB-167 138 Div. 2, 13

Brown and Root, Inc., Houston, Tex.
GRAVITY AND MAGNETIC SURVEY: UVALDE AREA PROJECT IN UVALDE AND ZAVALA COUNTIES, TEXAS,
Jul 64, 44p
Contract NSF C-260

Unclassified report

Rept. on Proj. Mohole.
Document is not reproducible and is available from the Clearinghouse on loan only.

Descriptors: (*Well logging, Feasibility studies), (*Geophysical prospecting, Texas), Gravity, Terrestrial magnetism, Structural geology, Maps.

The objective of the field survey was to locate an igneous intrusive mass (basalt) which could be drilled to a depth of at least 5000 feet for the purpose of testing coring and logging techniques. The combination of gravity and magnetic methods was selected as the most suitable means of delineating a basalt mass which would be satisfactory for the drill test. Each of the methods responds to changes in potential force fields which are related to the physical properties of underlying rocks. The force of gravity varies in response to lateral changes of density in the substrata; the magnetic field is affected by lateral variations in the susceptibilities of underlying rocks.

PB-167 139 Div. 2, 17
CFSTI Prices: HC$3.00 MF$0.50

Reed Roller Bit Co., Houston, Tex.
EVALUATION OF DRILL PIPE FOR MOHOLE PROJECT.
16 Apr 64, 52p
Contract NSF C260

Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Available copy will not permit fully legible reproduction.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Fatigue (Mechanics), Couplings, Stresses, Tensile properties, Impact shock, Hardness, Heat treatment, Fracture (Mechanics), Drilling machines, Physical properties, Specifications, Graphics, Tests.

Physical properties and hardness values for the drill pipe tested were in line with those expected for this grade of pipe, and indicated good response to heat treatment for the chemical compositions used. C-Ring and notched bend tests gave results believed to be representative of material of this hardness level, but we have not had sufficient experience with these tests for detailed evaluation. Longitudinal hardness surveys through the flashweld area and upset zone are typical for the grades of material used. Rotary fatigue tests pipe failures originated on the outside of the pipe in all but two instances. The two instances of inside failure origination were on different lengths of pipe from the same vendor. The other two specimens from this vendor have not been tested to failure. In all cases of outside failure, crack initiation occurred in longitudinal grinding marks existing in the pipe when received for testing. No failures have originated in the 'wrinkles' found in the upset area of the pipe. A detailed investigation of all failures is being made and will be reported later. All pipe failures occurred within a maximum distance of 4 inches from the base of the upset. This rather localized area of failure may be the result of the relatively steep bending moment gradient created by the necessarily short moment arm of 70 inches. Conceivably, under service conditions, failures would occur over a greater pipe length. (Author)

PB-167 140 Div. 2, 13, 26
CFSTI Prices: HC$2.00 MF$0.50

Schlumberger Well Surveying Corp., Houston, Tex.
DESIGN PROPOSAL OF SURFACE AUXILIARY LOGGING EQUIPMENT FOR BROWN AND ROOT, INC. PROJECT MOHOLE, PHASE II.
1 Apr 64, 30p
Contract NSF C260

Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Hoists, Well logging), Design, Mechanical drawings, Electric cables, Generators, Specifications, Operation, Drilling machines, Floating bodies, Marine geology.

This unit is designed to perform many functions during Phase II of Project Mohole. The main functions of the Logging Unit are: (A) Logging Services - By using the 7-conductor electrical cable, different tools developed by the logging industry can be used to determine character of the formations penetrated by the drill. (B) Coring - This unit will be used to retrieve cores taken by a special coring tool or the standard Schlumberger Sample-taker coring tool. The latter tool can bring up samples from 30 different levels in one trip. (C) Turbodrill Monitoring - The electronic tool used to monitor operation of the turbodrill will be handled with one of these units. Since this operation will require continuous use of the unit, a second identical Logging Unit is provided for redundancy. Ordinarily, one of the units will be used primarily for the turbodrill monitoring and the other for logging operations. However, both units can be used interchangeably for either operation.

PB-167 141 Div. 2, 13
CFSTI Prices: HC$1.00 MF$0.50

Western Geophysical Co. of America, Los Angeles, Calif.

REFLECTION AND VELOCITY PROFILES AT THE OUTER RIDGE, PUERTO RICO,
Revised ed.,
by C. H. Savit, W. A. Knox, D. M. Blue, and L. Paitson. 13 Nov 63, 20p
Contract NSF C260

Unclassified report

Rept. on Proj. Mohole.
Prepared on Subcontract to Brown and Root, Inc., Houston, Tex.
Pub. in Journal of Geophysical Research (U. S.) v69 n4 p701-19 Feb 15 1964.
Revision of manuscript submitted 19 Aug 63.
Available copy will not permit fully legible reproduction.

Descriptors: (*Well logging, Feasibility studies), (*Seismology, Geophysical prospecting), (*Marine geology, Caribbean Sea), Marine geophysics, Puerto Rico, Graphics, Site selection, Drilling machines, Floating bodies.

Reflection profiling using the long-array technique of exploration seismology together with reflection velocity surveys discloses an intricate fine structure in the large amounts (up to 1.5 sec) of sediments that overlie a 'basement' surface delineated by previous reflection techniques at the outer ridge. A rough surface underlies the deeper, stratified sediments, whereas a smooth surface separates them from overlying, low-velocity (1.7 km/sec), more homogeneous sediments. Neither homogeneous nor stratified sediments are necessarily concordant with the ocean-bottom configuration. Previously reported indications of 3.0-km/sec velocities are confirmed for the deeper stratified sediments. (Author)

PB-167 142 Div. 2, 13
CFSTI Prices: HC$1.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
EFFECTS OF MUD WEIGHT ON RISER CASING BURST.
Mar 64, 11p
Contract NSF C260

Unclassified report

Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Well logging), (*Rupture, Pipes), Weight, Cutting fluids, Tables, Graphics, Drilling machines, Floating bodies, Marine geology.

Six curves are presented, showing the effect of mud weight vs depth with regard to burst with a safety factor of 1, 1.5 and 2 on each weight of pipe. The curves are based on static calculations with no allowances made for the effects of bending current profile, temperature, corrosion, etc. The effect of collapse is based on the collapse rating of the pipe with 40,000 psi axial tension stress.

PB-167 143 Div. 2, 13
CFSTI Prices: HC$2.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
FEASIBILITY STUDY FOR BRIDLE SYSTEM.
30 Dec 63, 39p
Contract NSF C260

Unclassified report

Rept. on Proj. Mohole.
Available copy will not permit fully legible reproduction.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Supports), Drilling machines, Stresses, Cables (Mechanical), Deformation, Moments, Floating bodies, Marine geology.

As the drilling vessel drifts away from the center position immediately above the hole, the riser casing is inclined away from the line in which it would hang if supported from a point on a vertical line above the hole. The drift of the vessel also increases the distance from the derrick floor to the landing base. The increase in this distance will necessitate an elongation of the riser casing; however, this elongation does not enter into the design of the bridle system. If the top end of the riser casing is rigidly attached to the drilling vessel, then as the vessel drifts off center a bending moment will develop at the top of the casing. This bending is caused by the angular deflection of the casing with respect to the vessel. Under the most severe operating conditions the stress at the top of the riser casing becomes too great for the pipe material to withstand. The bridle system is proposed to reduce the bending moment at the top of the riser under adverse conditions. (Author)

PB-167 144 Div. 2, 14
CFSTI Prices: HC$1.00 MF$0.50

Corning Glass Works, N. Y.
10 INCH DIAMETER HOLLOW GLASS SPHERES FOR BROWN AND ROOT, INC. PROJECT MOHOLE.
Technical rept.
by W. J. Lekki. 1964, 9p
Contract NSF C260

Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.

Descriptors: (*Well logging, Feasibility studies), (*Glass, Spheres), Pressure, Tests, Epoxy plastics, Seals (Stoppers), Coatings, Abrasives, Captive tests, Non-destructive testing, Damage, Specifications, Buoyancy, Oceanographic equipment.

Conclusions: Two hemispheres having ground surfaces which are then epoxy sealed together have an average implosion pressure of 6,000 PSI, range 4-8,000 PSI. It is concluded that the quality of the ground surface seriously affects the implosion pressure of such units. If this type of seal were to be used in the future, it is felt that either a finer grind or even a highly polished surface should be used, since the quality of this surface is extremely critical to the strength of the unit. In general this approach would not be recommended for units required for deep water applications. The fusion sealed monolythic unit is by far the best designed piece. The relatively low implosion pressure, 11,500 PSI for sphere no. 3.3 should not be considered as representative of the strength of the 10 inch diameter sphere. The design strength of the 10 inch diameter unit can be assumed to be approximately 18,000 PSI. The resulting product of all implosions of glass spheres is a mass of powdered glass. When a unit fails under pressure it does not merely split or crack, but completely powders. From the scratches obtained in the outer surface of several of the spheres during pressure testing, it appears apparent that such damage does not have a serious effect on the strength of the sphere. The scratches on sphere no. 3.1 were of significant size and yet the sphere withstood a pressure of 11,500 PSI without failure.

PB-167 145 Div. 2
CFSTI Prices: HC$1.00 MF$0.50

Gravity Meter Exploration Co., Houston, Tex.

AEROMAGNETIC INTERPRETATION, PUERTO RICO TRENCH,
by Nelson C. Steenland. 20 Nov 63, 15p
Contract NSF C260

Unclassified report

Rept. on Project Mohole.
Prepared on subcontract to Brown and Root, Inc., Houston, Tex.

Descriptors: (*Terrestrial magnetism, Caribbean Sea), (*Well logging, Feasibility studies), (*Marine geophysics, Terrestrial magnetism), Puerto Rico, Airborne, Magnetometers, Marine geology, Maps.

This is the report on the interpretation of an aeromagnetic survey of 47,000 sq. mi. of Puerto Rico and the adjacent ocean including the area of the Puerto Rico Trench. The purpose of the analysis is to define whether or not a seismically determined basement under the ocean-covered areas is a magnetic basement and, secondarily, the nature of this basement. For this purpose the magnetic data are analysed without recourse to any other geologic or geophysical data. The results are shown on a map of the Magnetic Basement at 1:500,000 with a contour interval of 2000 ft. These results may be compared with the seismic basement. One such comparison is included along section AA' over the trench and the northern platform. The general form of both profiles is very similar. Moreover, fourteen point-by-point comparisons show that the average error of the magnetic results relative to the seismic results without regard to sign is 6%. As the generally accepted error of magnetic depth determinations under the best of circumstances is 5%, there is little doubt that the seismic basement and the magnetic basement are the same horizon. (Author)

PB-167 146 Div. 2, 13

Western Geophysical Co. of America, Los Angeles, Calif.
SITE SURVEYS. PUERTO RICO AREA.
Final rept. Revised.
Mar 64, 103p
Contract NSF C260

Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Document is not reproducible and is available from the Clearinghouse on loan only.
Revision of rept. dated 14 Feb-24 Mar 63.
Rept. on Project Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Site selection, Puerto Rico), (*Marine geology, Puerto Rico), Seismology, Geophysical prospecting, Sedimentation, Stratigraphy.

A seismic survey was made of the Outer Ridge and Barracuda Fault areas to produce 1156 km of reflection and refraction coverage. Results of the reflection survey were excellent, yielding a clear and detailed picture of the entire sedimentary column above the basement. Overall sediment thickness ranged from virtually zero to 3 km. Refracted arrivals were obtained from the top of the basement, or Layer 2 (4.3 km/sec), from the top of the oceanic crust (6.3 km/sec), and from the top of the mantle (8.3 km/sec). At several locations in both survey areas, mantle is found shallower than 9.0 km below sea level. The shallowest observed mantle is 8.0 km below sea level at RF C-1, Barracuda Fault. Over much of both areas of survey, mantle is within 10 - 12 km of sea level. Both reflection and refraction data indicate that basement configuration is uneven, and that fault structures displace both the oceanic crust and the mantle. Topographic trends at Outer Ridge do not necessarily coincide with subsurface structural trends; the topographic high strikes ESE, whereas the mantle high strikes ENE. At Barracuda Fault, topographic and subsurface features are coincident.

PB-167 147 Div. 2, 13
CFSTI Prices: HC$1.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
SWIVEL WASHPIPE TESTS.
Final rept.
Mar 64, 13p
Contract NSF C260

Unclassified report

Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Seals (Stoppers), Tests), Pipes, Deflection, Wear resistance, Test equipment, Performance (Engineering), Specifications, Drilling machines, Floating bodies, Marine geology.

Discussion is presented on the test stand, washpipe assemblies, and test results. On all the sets of packing tested, the most wear occurred at the heel of the packing rings.

PB-167 148 Div. 2, 13, 14, 31
CFSTI Prices: HC$5.00 MF$1.25

General Motors Corp., Dayton, Ohio. Inland Manufacturing Div.
TESTING SYNTACTIC FOAM BUOYANCY MATERIALS (IN 5 PARTS).
Final rept. for 26 Feb-1 Oct 64.
1964, 182p
Contract NSF C260

Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Buoys, Foams), (*Foams, Buoys), (*Expanded plastics, Buoys), Marine geology, Buoyancy, Creep, Aging (Materials), Phenolic plastics, Epoxy plastics, Glass, Antifouling coatings, Hydrostatic pressure, Compressive properties, Shear stresses, Asphalt, Drilling machines, Floating bodies.

The report covers work done on the testing of syntactic foam buoyancy materials. Creep testing is 70% complete. The static aging tests are about 90% complete. Detailed reports on these tests will be submitted upon their completion. Two phenolic-epoxy and two glass-epoxy compositions of syntactic foam were immersed in twenty feet of water. These compositions, which were coated with various materials including anti-fouling paints, will remain immersed for six months to determine the merit of the coating materials in decreasing marine fouling. (Author)

PB-167 149 Div. 2, 13

National Supply Co., Torrance, Calif.
DRAWWORKS DESIGN DATA.
16 Nov 64, 55p
Contract NSF C260

Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.

Document is not reproducible and is available from the Clearinghouse on loan only.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Hoists, Drilling machines), Design, Mechanical drawings, Specifications, Marine geology.

The drawworks is 15 ft high x 20 ft 8 in. wide x 31 ft long and weighs approximately 160,000 lb without motors, controls, and auxiliary brake. The drum of the drawworks is 54 in. in diameter x 92 in. in length and is grooved for 1 3/4 in. diam drilling line. Four hoisting speeds are obtained by the incorporation of a two-speed transmission in combination with two drives to the drum shaft. The gear ratio selected for low drive provides the specified 1,000,000-lb hook load capacity at a constant speed of 90 feet per minute; this speed has sufficient torque multiplication to hoist 1,000,000-lb load with one of the four driving motors out of service. The four electric motors have a rating of 3,968 horsepower at 920 revolutions per minute. Both the high and low drum clutches are air-operated friction type; an integral manually operated jaw clutch is also provided for emergency use in the event of air supply failure. In addition to manual operation of the mechanical brake, a power system has also been provided that transmits to the driller a sense of feel of the amount of braking effect being accomplished. The force and motion applied to the brake by the power booster is proportional to the force and motion applied to the braking lever by the driller. An auxiliary brake of an electric or eddy current type will be installed on the drawworks. (Author)

PB-167 150 Div. 2, 13
CFSTI Prices: HC$1.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
7 IN. RISER TO BASE LATCH-PROTOTYPE.
1964, 24p
Contract NSF C260 Unclassified report

Rept. on Proj. Mohole.
Available copy will not permit fully legible reproduction.

Descriptors: (*Well logging, Feasibility studies), (*Disconnect fittings, Design), Pipes, Models (Simulations), Corrosion, Corrosion inhibition, Sea water, Drilling machines, Floating bodies, Marine geology.

All of the operating mechanism is enclosed in an oil bath to prevent corrosion fatigue that might be brought about by sea water environment. A discreet pressure balance is maintained within the tool at all times to prevent the possibility of malfunction due to the action of any pressure differential. When in place within the landing base throat, the latch tool encapsulates itself by providing an upper and lower sealing device. These two seals at opposite ends of the tool provide the capability of a preselected environment. This prototype will engage and lock into a groove of the same size and configuration as that used in setting the casing string.

PB-167 151 Div. 2, 13
CFSTI Prices: HC$1.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
COMPARISON OF CURRENT PROFILES,
1963, 3p
Contract NSF C260
Rept. on Proj. Mohole. Unclassified report

Descriptors: (*Well logging, Feasibility studies), (*Ocean currents, Analysis), Diurnal variations, Marine geology, Drilling machines, Floating bodies.

Design bases for the various current profiles are presented.

PB-167 152 Div. 2, 13
CFSTI Prices: HC$4.00 MF$1.00

Brown and Root, Inc., Houston, Tex.
WIND AND WAVE STATISTICS FOR PROPOSED MOHOLE DRILLING SITES. PART A. ATLANTIC SITE 16 DEGREES N, 58 DEGREES W. PART B. PACIFIC SITE 22 DEGREES N, 156 DEGREES W,
by R. O. Reid. 13 Dec 64, 127p
Contract NSF C260
Unclassified report

Rept. on Proj. Mohole.
Available copy will not permit fully legible reproduction.

Descriptors: (*Well logging, Feasibility studies), (*Ocean waves, Wind), Atlantic Ocean, Pacific Ocean, Site selection, Drilling machines, Oceanology, Statistical analysis, Floating bodies, Marine geology.

The Atlantic Ocean site information presented concerns wind statistics (speed and direction), sea (heights and direction, swell (heights and direction) composite sea and swell (heights and periods), joint distribution of heights and periods for composite sea and swell, and lastly, spectral considerations. The Pacific site has very nearly the same wind speed statistics (8-12 knots and the same mode for the year) as the Atlantic site. The available statistical information on sea and swell for the Pacific is very limited; it has been necessary to make use of such well resolved information as wind velocities to inter a reasonable picture of the sea state histograms.

PB-167 153 Div. 2, 13

National Engineering Science Co., Pasadena, Calif.
CONSIDERATION OF CURRENTS AT THE PROPOSED MOHOLE DRILLING SITES IN THE ATLANTIC AND THE PACIFIC,
by R. O. Reid. 10 Oct 64, 111p
Contract NSF C260
Unclassified report

Rept. on Proj. Mohole.
Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Document is not reproducible and is available from the Clearinghouse on loan only.

Descriptors: (*Well logging, Feasibility studies), (*Ocean currents, Floating bodies), Site selection, Atlantic Ocean, Pacific Ocean, Oceanographic data, Graphics, Marine geology, Drilling machines.

The report presents the results of estimated current force vs. ocean depth at the following two sites: Atlantic - 16 degrees north, 58 degrees west; Pacific - 22.5 degrees north, 156 degrees west. Direct observations of currents, particularly at or near the above sites, are either completely unavailable or too incomplete, with respect to depth, to give an adequate picture of the current statistics. Accordingly, it has been necessary to put together all available indirect measurements supplementing the few direct measurements and then make inferences from theory where necessary.

PB-167 154 Div. 2, 13
CFSTI Prices: HC$1.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
REFLECTION SURVEY AT BARRACUDA FAULT,
by L. Paitson, C. H. Savit, D. M. Blue, and W. A. Knox. 13p
Contract NSF C260 Unclassified report

Pub. in Geophysics (U. S.) v29 n6 p941-50 Dec 1964
Rept. on Proj. Mohole.
Presented in part at the Annual SEG Meeting (33rd), held at New Orleans, La., 23 Oct 63.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Seismology, Geophysical prospecting), (*Marine geology, Caribbean Sea), Faults (Geology), Seismic waves, Reflection, Refraction, Graphics, Site selection, Drilling machines, Floating bodies.

This paper presents the results of a reconnaissance survey conducted by Western Geophysical Company over the Barracuda Fault structure, which is located about 200 miles east of Guadeloupe Island in the West Indies. This was one of the areas selected for evaluation as a potential site for drilling through crust to mantle. The reflection profiling obtained as accessory data to crustal refraction profiles revealed 5.5 km of relief associated with this structure. As an aid to the refraction interpretation, reflection profiles were obtained on all refraction lines to provide accurate measurement of thickness of the two shallowest layers: water and sediment. The data obtained contained information of interest far beyond the primary purpose and are presented in this report with a minimum of interpretation, but in a form complete enough for the interested reader to effect his own interpretation. (Author)

PB-167 155 Div. 2, 13
CFSTI Prices: HC$2.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
RISER BUOYANCY CONTROL SYSTEM. DESCRIPTION AND USE OF GRAPHS FOR VARIABLE DISPLACEMENT BUOY ACTIVATION COMPUTATIONS.
Staff rept.
1964, 42p
Contract NSF C260

Unclassified report

Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Buoyancy), (*Buoys, Supports), Compressed air, Nitrogen, Liquefied gases, Cryogenics, Storage, Gas flow, Marine geology, Heat, Vaporization, Graphics, Engines and motors, Drilling machines, Floating bodies.

The report contains graphs to simplify the preliminary calculations for onboard mechanical equipment required in the inflation of the variable displacement buoys of the riser support system. A dual inflation facility is proposed: for normal operation consideration is given to a compressed air system powered by electric, diesel, or air motor. The other system is an emergency inflation system that uses cryogenic nitrogen stored in Dewars on board the drilling vessel. In order to specify equipment and piping for these systems, it is necessary to determine the total quantity of gas required and the flow rate with which it must be supplied to the buoy. Additional information is needed for the nitrogen system in that the requirements of heat necessary to vaporize the liquified gas must be calculated. The methods of calculating these quantities by graphs are illustrated. (Author)

PB-167 156 Div. 2, 13, 26
CFSTI Prices: HC$1.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
LINER-CASING HANGER AND SETTING TOOL PROTOTYPE.
Staff Evaluation.
1963, 17p
Contract NSF C260

Unclassified report

Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Drilling machinery, Well logging), Design, Floating bodies, Marine geology, Mechanical drawings.

The hanger is of such design that it will not permit disengagement of the setting tool until the hanger is in the proper position within the landing base. Vertical and lateral blows on the liner casing or the casing hanger itself will not cause accidental release of the setting tool. The setting, locking and releasing will all be automatically accomplished by vertical reciprocating motion of the drill pipe. The design of the casing hanger is such as to permit the nesting of one hanger inside of another as successive strings of liner casing are run one inside the other. The design of the casing hanger is compatible with the operation of the riser to base latch and will permit the nesting of that tool inside of the last casing hanger installed in the landing base. The setting tool is adaptable to other uses than the setting of liner casing hangers. A releasable latch lock tool has been developed using the same setting tool as will be employed in the prototype tests. (Author)

PB-167 157 Div. 2, 13, 31
CFSTI Prices: HC$4.00 MF$1.00

Western Gear Corp., Lynwood, Calif. Systems Management Div.
DESIGN OF DRILLING VESSEL POSITIONING UNITS. Final design concepts.
Aug 64, 136p Rept. no. SMR-221
Contract NSF C260

Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Rept. on Proj. Mohole.

Descriptors: (*Drilling machines, Well logging), (*Well logging, Feasibility studies), (*Marine propulsion, Well logging), (*Floating bodies, Drilling machines), Mechanical drawings, Hulls (Marine), Drilling machinery, Hoists, Design, Oceanographic vessels, Marine geology, Positioning devices (Machinery).

The report summarizes the results of the preliminary studies concerning the design, installation and operation of the Positioning Units for the Mohole Drilling Vessel. The conceptual designs have progressed to a stage where they are ready to submit for bids for manufacturing. The report therefore discusses the overall concept and describes the designs in some detail. The basic parameters which have been used as guidelines for the study are recorded for reference.

PB-167 158 Div. 2, 13
CFSTI Prices: HC$4.00 MF$1.00

Westinghouse Electric Corp., Sunnyvale, Calif.
PROJECT MOHOLE. UNDERWATER GAS GENERATOR. Preliminary design rept.,
by A. E. Patterson. 25 Feb 65 122p
Contract NSF C260

Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.

Descriptors: (*Well logging, Feasibility studies), (*Gas generating systems, Underwater), (*Floats, Gas generating systems), Buoys, Buoyancy, Jatos, Coolants, Ammonia, Carbon dioxide, Valves, Firing circuits, Propellants, Materials, Pipes, Exhaust gases.

In the design and development of an underwater gas generator, this preliminary design report outlines the progress made to date on the prototype design and projects plans for early accomplishment of final design. Submitted with the report are assembly drawnings delineating two concepts for the proposed full-scale underwater gas generator. One concept utilizes ammonia as a coolant and is capable of operating at depths up to 333 ft. The other concept utilizes CO2 and is capable of operating at depths up to 400 ft. The design utilizing CO2 is preferred since it will satisfy the design depth criterion of 400 ft and is compatible with the materials being considered for the system and buoy. Also submitted are drawings showing the configuration and testing of a multiple unit small-scale prototype and the surface test arrangement for a single stage full-scale prototype. The purpose of the multiple unit small-scale prototype is to test the workability of the full-scale design under submerged conditions. (Author)

PB-167 159 Div. 2, 13, 26
CFSTI Prices: HC$2.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
DIAMOND CORE BITS STUDY.
Staff rept.
1964, 28p Unclassified report
Contract NSF C260
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Drills, Diamonds), Penetration, Weight, Rotation, Performance (Engineering), Graphics, Drilling machines, Floating bodies, Marine geology.

An analysis is presented of data gathered on diamond core bits during the Uvalde equipment evaluation test program. A series of time-penetration charts which plot bit penetration per revolution versus weight on bit for formations of varying densities is plotted for six 9 7/8-in. x 4 7/8-in. diamond core bits and for six 9 7/8-in. x 2-in. diamond turbocorer bits. Performance curves are recorded separately for each of the twelve bits as well as cumulatively for the 9 7/8-in. x 4 7/8-in. and 89 7/8-in. x 2-in. (Author)

PB-167 160 Div. 2, 13, 14, 31
CFSTI Prices: HC$1.00 MF$0.50

General Motors Corp., Dayton, Ohio. Inland Manufacturing Div.
COMPOSITE STRUCTURES UTILIZING INLYTE BUOYANCY MATERIALS,
by A. J. Bartholomew. 16 Feb 65, 22p
Contract NSF C260
Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Buoys, Composite materials), (*Foams, Buoys), (*Expanded plastics, Tensile properties), (*Composite materials, Tensile properties), Marine geology, Epoxy plastics, Glass, Asphalt, Compressive properties, Buoyancy, Spheres, Cylindrical bodies, Hydrostatic pressure, Drilling machines, Floating bodies.

Results are reported of comparisons of the strength of hollow Inlyte and a composite of Inlyte and large glass spheres with that of solid Inlyte. (Author)

PB-167 161 Div. 2, 13, 26
CFSTI Prices: HC$4.00 MF$1.00

Curtiss-Wright Corp., Caldwell, N. J.
THE FATIGUE ANALYSIS OF THE MOHOLE DRILL PIPE, AND ASSOCIATED PROBLEMS,
Rept. no. 1, May 64-Feb 65,
by F. B. Stulen and W. C. Schulte. 15 Feb 65,
124p Rept. no. C-2951
Contract NSF C260
Unclassified report

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Drilling machinery, Fatigue (Mechanics)), (*Pipes, Well logging), Failure (Mechanics), Feasibility, Probability, Steel, Floating bodies, Marine geology.

Contents:
Structural problem of the drill pipe
Method of fatigue analysis
Fatigue test data of the 135-type steel and pipe
Analysis of the test data
Typical calculations for fatigue life.

PB-167 162 Div. 2, 17
CFSTI Prices: HC$1.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
CRACK PROPAGATION STUDIES.
1965, 10p
Contract NSF C260
Unclassified report

Rept. on Proj. Mohole.
Prepared on subcontract to Brown and Root, Inc., Houston, Tex.

Descriptors: (*Well logging, Feasibility studies), (*Fracture (Mechanics), Steel), (*Steel, Fracture (Mechanics), Propagation, Environmental tests, Sea water, Stresses, Experimental data, Drilling machines, Floating bodies, Marine geology.

The report, with tables and figures, presents the experimental results of crack propagation tests conducted in unagitated seawater at 60 cpm. These tests showed a significant decrease in crack initiation time, and a significant increase in crack propagation rate as compared to similar data obtained in air. The tests also indicated that optical means are satisfactory for observation of crack growth in seawater, but that observation of crack growth rates in drilling mud will require an alternate means. (Author)

PB-167 163 Div. 2, 13, 17
CFSTI Prices: HC$1.00 MF$0.50

Brown and Root, Inc., Houston, Tex.
STUDY OF TITANIUM-ARMORED WIRE FOR LOGGING CABLE.
Staff rept.
1963, 8p
Contract NSF C260 Unclassified report

Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Cables (Mechanical), Well logging), (*Titanium, Cables (Mechanical)), Steel, Wire, Corrosion inhibition, Coatings, Strength, Drilling machines, Floating bodies, Marine geology.

The use of titanium armor versus steel armor for the logging cable was studied. Comparisons were made regarding corrosion resistance in salt water, strength-to-weight ratio, availability, and cost. Active pursual of this development will not be made inasmuch as results of this study indicate that now the advantages do not offset the disadvantages. (Author)

PB-167 164 Div. 2, 13, 27, 31
CFSTI Prices: HC$2.00 MF$0.50

Honeywell, West Covina, Calif. California Ordnance Center.
MOHOLE SHIP POSITIONING SYSTEM; FINAL ISSUE OF MATH MODEL.
5 Feb 65, 27p Unclassified report
Contract NSF C260

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Available copy will not permit fully legible reproduction.
Rept. on Proj. Mohole.

Descriptors: (*Well logging, Feasibility studies), (*Control systems, Well logging), (*Mathematical models, Well logging), (*Marine propulsion, Well logging), Motion, Equations, Operation, Ships, Navigation computers, Drilling machines, Floating bodies, Positioning devices (Machinery), Marine geology.

The report presents mathematical expressions for the control and environmental force functions for the Mohole platform equations of motion. Mathematical equations representing environmental forces, control forces, translational forces, and rotational forces are derived. (Author)

PB-167 165 Div. 2, 13, 19, 31
CFSTI Prices: HC$6.00 MF$1.50

Honeywell, West Covina, Calif. California Ordnance Center.
POSITIONING STUDIES.
1964, 263p Unclassified report
Contract NSF C260

Prepared on subcontract to Brown and Root, Inc., Houston, Tex.
Contents: Preliminary Study of Mohole Vessel Positioning System Performance; Technical memo no. TM-6148-P-01; MH-6145-005. Mohole Vessel Positioning System Reliability. Drilling Platform Motor Controls. Positioning Buoy Design Preliminary Report on Configuration and Drag of a Single-Point Moor; MH-6146-1128-3. Drill Platform Positioning Computer, MH-6145-003. Review of Positioning Systems; MH-6146-1128-2. A Study of Vessel Position Display Systems; MH-6145-002. Review of Positioning Systems; MH-6146-1128-1.

Descriptors: (*Well logging, Feasibility studies), (*Ships, Well logging), (*Drilling machines, Marine geology), (*Floating bodies, Drilling machines), Navigation computers, Position finding, Display systems, Buoys, Radar navigation, Sonar, Positioning devices (Machinery).

PB-167 166 Div. 2, 13, 31
CFSTI Prices: HC$6.00 MF$1.25

Brown and Root, Inc., Houston, Tex.
PROJECT MOHOLE.
1964, 226p Unclassified report
Contract NSF C260

Rept. includes:
Stability Analysis of Section of Mohole Platform Lower Hull between Bulkheads Paslay rept. no. 1, Oct 64.
Model Tests of Project Mohole Drilling Platform; Final rept., Univ. of Michigan, Aug 64.
On the Stability of Rectangular Plates Reinforced by Stiffeners and Subjected to Bending and Shearing; pub. in International Association for Bridge and structural Engineering, v3 p141ff 1947.

Descriptors: (*Well logging, Feasibility studies), (*Ship hulls, Stability), (*Ships, Well logging), (*Rectangular bodies, Stability), Bulkheads, Drilling machines, Reinforcing materials, Deformation, Shear stresses, Marine geology, Floating bodies.

Contents:
Stability analysis of section of Mohole platform lower hull between bulkheads
Model tests of project Mohole drilling platform
On the stability of rectangular plates reinforced by stiffeners and subjected to bending and shearing.

PB-167 207 Div. 2
CFSTI Prices: HC$1.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
SUPPLEMENTAL CONTROL SURVEYS FOR PHOTOGRAMMETRIC MAPPING,
by Lawrence W. Swanson. 1959, 11p Unclassified report

For presentation at the Seminar on Aerial Survey Methods and Equipment under sponsorship of United Nations held in Bangkok, Thailand, 4 Jan-5 Feb 60.

Descriptors: (*Surveying, Photogrammetry), (*Photogrammetry, Surveying), Mapping, Stereoscopic map plotters, Control.

PB-167 299 Div. 2, 13, 30, 31
CFSTI Prices: HC$1.00 MF$0.50

National Science Foundation, Washington, D. C.
PROJECT MOHOLE.
1964, 15p Unclassified report

Descriptors: (*Well logging, Feasibility studies), (*Marine geology, Well logging), Geophyical prospecting, Geology, Floating bodies, Drilling machines, Ships, Design, Puerto Rico, Oceanology, Scientific research, Ocean bottom sampling.

Project Mohole a project in the earth sciences that will permit men to drill much farther down than ever before--ultimately, it is hoped, through the crust of the earth into the underlying mantle. The program will be undertaken from a huge platform at sea. It will involve sending a drill bit into the ocean bottom to bring up cores of the sediments and rocks that lie below, to measure the earth's heat flow and gravity, and to provide scientists with a vast amount of information on the history of the earth. In addition, through the use of instruments lowered from the platform, scientists will gather knowledge about the oceans themselves--their tides and currents at various depths, their salinity, and their temperature.

3. Chemical Warfare Equipment and Materials

No Entries

4. Chemistry

Patent 3,173,755 Div. 4

SYNTHESIS OF CALCIUM CYANAMIDE.
Patent assigned to Army,
by Jean P. Picard and Marcel Blais. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Calcium compounds, Organic nitrogen compounds), (*Guanidines, Organic nitrogen compounds), Urea, Oxides, Synthesis (Chemistry), Patents.

Graphite-free calcium cyanamide may be used in the manufacture of nitroguanidine. Urea and calcium oxide are reacted in a molar ratio of 3:1 in a closed kettle at 300 degrees C. until a solid is formed and ammonia is given off. The solid is crushed and reheated in a kiln to about 700 degrees C. to form calcium cyanamide and carbon dioxide.

Patent 3,173,761 Div. 4

USE OF GIRARD T REAGENT IN QUANTITATIVE ALIPHATIC n-ALDEHYDE DETERMINATIONS.
Patent assigned to Agriculture,
by Adam M. Gaddis and Rex Ellis. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Aldehydes, Quantitative analysis), (*Ketones, Quantitative analysis), Alcohols, Amines, Hydrazine derivatives, Hydrazones, Ammonium compounds, Patents.

An analysis of a monocarbonyl compound, especially the aliphatic monocarbonyls such as saturated aldehydes, unsaturated aldehydes and alkanones is obtained by contacting the monocarbonyl compound in solution in tertiary butyl alcohol with trimethyl ammonium acetylhydrazine chloride until the monocarbonyl compound has reacted essentially quantitatively to produce a water-soluble hydrazone, separating the hydrazone from the reaction mixture, reacting the hydrazone with 2,4-dinitrophenylhydrazine in the presence of dilute aqueous hydrochloric acid to produce the corresponding 2,4-dinitrophenylhydrazone, separating the 2,4-dinitrophenylhydrazone and quantitatively determining the amount of monocarbonyl compound.

5. Communications

Patent 3,174,118 Div. 5, 18

COAXIAL CABLE RADIATION PREVENTION DEVICE UTILIZING A MASKING SPURIOUS SIGNAL GENERATOR.
Patent assigned to Army,
by Paul J. Moore. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Coaxial cables, Electromagnetic waves), (*Signal generators, Interference), Military intelligence, Electromagnetic shielding, Countermeasures, Patents.

The device prevents the interception of radiated intelligence from a dual shield coaxial cable. A spurious signal generator is connected across the outer and inner shields of a dual shield coaxial cable that has an intelligence signal being transmitted on the inner conductor of the cable. The amplitude of the spurious signal generator is adjusted to such a value that the level of radiation of the interfering signal from the spurious signal generator is in the order of several magnitudes greater than the level of radiation of the intelligence signal through the outer shield of the cable.

6. Detection

No Entries

7. Electrical Equipment

Patent 3,171,706 Div. 7, 22

SHIELDED ELECTRICAL CONNECTOR.
Patent assigned to Navy,
by Thaddeus E. Daniels and John R. Hacker. 2 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Electric connectors, Electromagnetic shielding), Patents, Design, Arming devices.

The connector is for use in a bomb arming unit. A tubular skirt is provided with a plurality of resilient fingers that contact the inside bore of a receptacle plug when the plug shell is telescoped into the receptacle shell. Any radiant energy picked up by the plug shell is shunted through a receptacle shell rather than through the connector pins of the bomb arming unit.

Patent 3,174,051 Div. 7

MINIMUM SIGNAL DETECTING CIRCUIT.
Patent assigned to Air Force,
by Franz L. Putzrath. 16 Mar 65
Available from Commissioner of Patents, Unclassified patent
Washington, D.C., 20231, $0.25

Descriptors: (*Circuits, Patents), Pattern recognition, Signals, Signal generators, Magnetic cores, Voltage, Winding, Errors, Hysteresis.

The circuit determines when an error signal or any complex voltage wave reaches a minimum value. The error voltage source may be a pattern matching system. The circuit includes a voltage source, an error voltage source, several resistors, a diode, a switch, a direct current source, a magnetic core with a magnetizing and output winding, and an output.

Patent 3,174,833 Div. 7, 4

HYDROGEN GENERATING CANISTER.
Patent assigned to Navy,
by Richard H. Blackmer. 23 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Gas generating systems, Hydrogen), (*Fuel cells, Gas generating systems), Electrochemistry, Direct current, Chemical reactions, Containers, Design, Patents.

The hydrogen gas generator is for use with fuel cells or electrochemical devices which supply a continuous D. C. current from an electrochemical reaction. In this generator, the reactants are caused to mix by positive forces and independently of any gravitational force while requiring only one control element to regulate the mixing.

8. Electronics and Electronic Equipment

Patent 3,171,191 Div. 8, 26

METHOD OF MAKING A MAGNETIC AMPLIFIER.
Patent assigned to Navy,
by Armand Cioccio and Herman M. Frazier.
2 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Magnetic amplifiers, Pulse amplifiers), Design, Patents, Winding, Electrical impedance, Shock resistance, Sensitivity.

The pulse type, variable current, magnetic amplifier has utility in military applications. A method is taught of making the five winding magnetic amplifier. The amplifier has variable sensitivity depending upon the value of two resistors.

Patent 3,172,042 Div. 8

PRECISION PHASED PULSE GENERATOR.
Patent assigned to Navy,
by Willis R. Dawirs. 2 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Pulse generators, Phase control devices), Patents, Phase shifters, Radiofrequency pulses, Relaxation oscillators, Frequency dividers.

The precision phased pulse generator may be used as a variable-width gate generator. A multivibrator is used which produces both on and off gates for both the delay period and for the period from the phased pulse to the next reference pulse. Either binary or decimal signals may be used for frequency division.

Patent 3,172,043 Div. 8

SIGNAL DELAY UTILIZING PLURALITY OF SAMPLERS EACH COMPRISING SWITCH, AMPLIFIER, AND STORAGE ELEMENT CONNECTED SERIALLY.
Patent assigned to Navy,
by Daniel E. Altman.
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Delay circuits, Rotary switches), Delay lines, Signals, Samplers, Amplifiers, Patents.

The apparatus for delaying a signal includes two delay lines, each of which includes a pair of input terminals, a pair of output terminals, and a plurality of signal samplers. A keying-signal generator has an output and a phase inverter has an input and an output. An arrangement is shown for alternately switching signals from the delay lines to a third pair of terminals so that only one signal is at the third pair of terminals at any one moment.

Patent 3,172,061 Div. 8

LOW LEVEL MAGNETIC MODULATOR.
Patent assigned to Navy,
by Andrew B. Malinowski. 2 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Magnetic modulators, Low frequency), Radio signals, Radio transmission, Magnetic cores, Oscillators, Resistors, Capacitors, Patents.

The modulator is for the conversion of very low power level signals of low frequency into a form which is readily transmittable by conventional radio wave techniques. The circuit includes a magnetic core with three windings, a square wave oscillator, a signal source, two current limiting resistors, a capacitor and output terminals.

Patent 3,172,111 Div. 8

MULTI-POLARIZED SINGLE ELEMENT RADIATOR.
Patent assigned to Navy,
by Louis D. Breetz. 2 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Dipole antennas, Radar antennas), (*Radar antennas, Dipole antennas), Early warning systems, Search radar, Transmitter-receivers, Spiral antennas, Polarization, Patents.

The antenna system is for use in radar systems. The folded dipole has all active components in a single plane and is capable of producing linearly polarized fields in orthogonally related planes as well as circularly polarized fields of either sense and various intermediate elliptical polarization fields.

Patent 3,172,112 Div. 8

DUMBBELL-LOADED FOLDED SLOT ANTENNA.

Patent assigned to Navy,
by Elwin W. Seeley. 2 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Slot antennas, Broadband), Patents, Transmission lines, Impedance matching, Resonance.

The broadband slot antenna is used in a waveguide. The structure includes an elongated slot having circular apertures at each end thereof to form a dumbbell shaped slot. A second slot is parallel to the elongated slot. The resonant radiation resistance of the antenna is varied by changing the width of the second slot.

Patent 3,172,113 Div. 8

CURVED ANTENNA WITH VARIABLY SPACED SLOTS.
Patent assigned to Army,
by Whilden G. Heinard and William H. Pepper.
2 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Slot antennas, Hypersonic planes), Guided missiles, Waveguide slots, Airframes, Curved profiles, Aerodynamic characteristics, Patents.

The antenna is for use with high speed aircraft and missiles. The slotted wave guide antenna can be supported by a curved airframe without affecting its aerodynamic characteristics. The radiating slots in the broad face of the wave guide are on the side away from the center of curvature.

Patent 3,174,119 Div. 8, 6

MICROWAVE RECEIVER PROTECTIVE CIRCUIT.
Patent assigned to Air Force,
by Robert J. Jones and George F. Farrell.
16 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Radar equipment, Suppressors), (*Suppressors, Radar equipment), Radar duplexers, Broadband, Diodes (Semiconductor), Radar receivers, Circuits, Radiofrequency power, Patents, Microwave networks, Tuning devices, Radar pulses, Cavity resonators, Microwave equipment.

The protective circuit is utilized in a radar system. A broad band T-R or duplexer of the coupled cavity type is provided. Its effectiveness does not depend upon the firing of a gas tube in the second cavity. The gas tube in the second cavity is replaced by a pair of oppositely poled variable reactance solid state diodes. Diodes of this type have a capacity across their terminals that varies with the applied voltage. Leakage from the first cavity into the second cavity increases the capacity of the diodes and detunes the cavity to such an extent that little power is passed to the receiver.

Patent 3,175,155 Div. 8, 5

SUBMODULATION SYSTEMS FOR CARRIER RE-CREATION AND DOPPLER CORRECTION IN SINGLE-SIDEBAND ZERO-CARRIER COMMUNICATIONS.
Patent assigned to Air Force,
by Floyd P. Holder. 23 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Single sideband communication systems, Modulators), (*Modulators, Single sideband communication systems), Doppler effect, Amplitude modulation, Transmitter-receivers, Frequency multipliers, Frequency dividers, Mixers (Electronics), Oscillators, Patents.

The single-sideband zero-carrier communication system includes a transmitter, a receiver and an interconnecting link between them. The transmitter includes a source of modulating signals, an R-F exciter, a carrier obtained by a multiplication, in a frequency multiplier, from an amplifier, a frequency divider, an amplitude modulator, a final R-F amplifier and a transmitting antenna. The receiver has an antenna, an R-F amplifier, a limiter, an envelope detector, a frequency multiplier, a single side band detector and an output.

Patent 3,175,156 Div. 8

AMPLITUDE SCANNING OF AN ANTENNA ARRAY ON RECEIVING.
Patent assigned to Air Force,
by Carlyle J. Sletten. 23 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Electronic scanners, Antennas), (*Antennas, Electronic scanners), Radiofrequency amplifiers, Multiple operation, Direction finding, Patents.

A signal receiving array is scanned by utilizing a variable gain radio frequency amplifier at each element of the array and combining the output of these amplifiers to produce a steerable directive receiving system or multiple beams from many receivers. The system can be used to determine the location of a communication or radar signal source.

Patent 3,175,158 Div. 8

CONTROLLED DECAY FEEDBACK TYPE COMB FILTERS.
Patent assigned to Army,
by Gail T. Flesher. 23 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Filters (Electromagnetic wave), Radar equipment), Radar signals, Discriminators, Signal-to-noise ratio, Amplifiers, Patents.

The comb filter is utilized in pulse radar systems where signals are weak and must be separated from the noise or to separate moving targets from stationary ones in a moving target indicator radar. The comb filter has a finite decay time.

Patent 3,175,162 Div. 8

NONDISCRIMINATING, BIPOLAR MONOSTABLE MULTIVIBRATOR.
Patent assigned to Army,
by James B. Winn. 23 Mar 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Relaxation oscillators, Design), Trigger circuits, Electron tubes, Diodes, Capacitors, Voltage, Power supplies, Resistors, Patents.

The nondiscriminating bipolar monostable multivibrator circuit includes a pair of vacuum tubes. The input has a pair of diodes and a pair of capacitors. A voltage source supplies operating voltage to the tubes through two resistors. The output pulse is time dependent upon the values of a coupling capacitor and a resistor.

Patent 3,175,195 Div. 8, 30

LONG TIME DELAY LINE.
Patent assigned to Navy,
by Frederick R. Fluhr, Donald J. McLaughlin, and Schuyler C. Wardrip. 23 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Delay lines, Data processing systems), Capacitors, Circuits, Amplifiers, Time-delay relays, Patents.

The time delay circuit is utilized in data processing systems. A data signal is supplied to a delay line requiring only one capacitor and one relay contact for each stored element of time resolution in the stored signal. The circuit requires only one read-in amplifier and one readout amplifier while performing only one readin-readout operation for each time element.

Patent 3,176,154 Div. 8, 30

THREE STATE MEMORY DEVICE.
Patent assigned to AEC,
by Forrest O. Salter. 30 Mar 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Tunnel diodes, Computer storage devices), (*Computer storage devices, Tunnel diodes), Computer logic, Circuits, Capacitors, Resistors, Direct current, Power supplies, Input-Output devices, Patents.

The switching or memory device is capable of three modes of operation. The device utilizes a tunnel diode capable of three stable modes of operation. A ternary computer can be built around the ternary element. The circuit includes a tunnel diode, an inductor, a capacitor, a direct current bias supply, a resistor, an input and an output.

Patent 3,176,161 Div. 8

TEMPERATURE-COMPENSATED PULSE-RESPONSIVE ELECTRONIC SWITCHING CIRCUIT.
Patent assigned to Navy,
by William C. Vertrees. 30 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Pulse counters, Switching circuits), (*Switching circuits, Pulse counters), Silicon, Electronic switches, Capacitors, Direct current, Diodes (Semiconductor), Resistors, Patents.

The pulse counting circuit employs a single silicon controlled switch which is fired or turned on by the accumulated charge built up on a storage capacitor by a series of pulses at the input of the circuit and switches a continuous direct current output voltage into the load device.

Patent 3,176,195 Div. 8

SUPERCONDUCTING SOLENOID.
Patent assigned to AEC,
by Roger W. Boom and Louis D. Roberts.
30 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Solenoids, Superconductors), Coils, Copper, Liquefied gases, Helium, Cryogenics, Circuits, Patents, Magnetic fields.

The superconducting solenoid can be used in communication devices which utilize high magnetic fields, for power generation, for the magnetic containment of energetic plasmas, and laboratory magnets for a wide variety of uses. The solenoid includes a superconductor coil and a secondary copper coil. The solenoid is immersed in liquid gas, such as helium, disposed in a dewar to provide an operating temperature of 4.2 degrees K. A circuit is shown with the solenoid.

9. Fluid Mechanics

PB-167 055 Div. 9
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
TANGENT FLOWS,
by L. M. Milne-Thomson. Jul 59, 7p
Technical summary rept. no. MRC-TSR-94
Contract DA11 022ORD2059
AD 225 914 Unclassified report

Descriptors: (*Fluid flow, Mathematical analysis), Integration, Two dimensional flow, Boundary layer.

A solution is developed which satisfies the exact solution of constant pressure at the free surface, perhaps with modified boundaries; the tangent flow. The discussion starts with the problem of finding free steamline flow under gravity with given boundaries. Only inviscid incompressible fluid in 2-dimensional irrotational steady motion is considered. The free streamline is the line of interaction of the free surface with the plane of the motion. The equation of motion of a heavy, inviscid fluid is written in the form rho(a-g) = -del p, where g is the acceleration due to gravity, a the acceleration, rho the density, and p the pressure in the fluid.

10. Fuels and Combustion

No Entries

11. Ground Transportation Equipment

No Entries

12. Guided Missiles

AD-447 995 Div. 12, 9
CFSTI Prices: HC$10.50

TRW Space Technology Labs., Redondo Beach, Calif.
AEROSPACE FLUID COMPONENT DESIGNER'S HANDBOOK, VOLUME I,
ed. by Glen W. Howell. May 64, 750p
Contract AF04 611 8385
RPL TDR-64-25; N64 32170

Unclassified report

Descriptors: (*Hydraulic systems, Aerospace craft), (*Aerospace craft, Fluids), (*Fluids, Handbooks), Heat transfer, Fluid mechanics, Design, Digital computers, Valves, Dynamics, Cleaning compounds, Acceleration, Shock (Mechanics), Specifications, Thrust vector control systems, Reliability, Materials, Corrosion.

The Aerospace Fluid Component Designers' Handbook is a compilation of basic information on the design, analysis, selection, and specification of valves and associated fluid components used in aerospace fluid systems. The handbook is intended to be used as a basic reference for engineers and other technical personnel who are involved in any phase of aerospace fluid component technology. It contains sections dealing with heat transfer, fluid mechanics, fluid systems, fluid components, modules, analysis, computers, specifications, contamination and cleaning, reliability, materials, and environments. The handbook will be revised periodically for the purposes of maintaining the currency of the data and adding applicable new material.

Patent 3,171,894 Div. 12, 8

DATA TRANSMISSION SYSTEM.
Patent assigned to Navy,
by Maxime G. Kaufman and Francis X. Downey.
2 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Space surveillance systems, Telemeter systems), (*Telemeter systems, Space surveillance systems), Frequency modulation, Detection, Tracking, Satellites (Artificial), Orbital trajectories, Communication systems, Patents.

The multichannel carrier system is for use with a space surveillance system which is employed for the detection and tracking of earth satellites and the computation of their orbital parameters. The system employs FM telemetry techniques.

Patent 3,173,637 Div. 12, 1

REFORMED PARACHUTE RECOVERY APPARATUS.
Patent assigned to Air Force,
by Reinhold J. Gross. 16 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Parachutes, Spacecraft), Reentry vehicles, Recovery, Deceleration, Parachute descents, Parachute fabrics, Patents.

The parachute is for lowering a space vehicle to earth. The parachute has concentric annular outer and inner fabric areas respectively of stronger and lighter less-strength fabrics in which the inner less-strength fabric area is reefed to remove the same from inflation by the slip stream during initial deployment, to cause preliminary deceleration of the chute by the outer relatively stronger fabric area, including time delay controlled reefing elements for releasing the inner less-strength fabric area to the slip stream following a predetermined deceleration of the parachute by the outer stronger fabric area.

13. Installations and Construction

Patent 3,174,781 Div. 13, 6

SEPARABLE COUPLING.
Patent assigned to Air Force,
by Everett J. Eastman. 23 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Couplings, Towers), Extendable structures, Bolts, Radar antennas, Supports, Patents.

The coupling device is used to join high scaffolding and radar antenna structures. The separable coupling includes two identical forked couplings, each half being secured to one of the two tubes to be joined. The forked couplings are held together by a bolt and nut. Each half of the coupling has a heel which is welded to a tube end.

14. Materials (Non-Metallic)

Patent 3,171,750 Div. 14

ELEVATED TEMPERATURE RESISTANT CERAMIC STRUCTURAL ADHESIVES.
Patent assigned to Air Force,
by Dwight G. Bennett, Richard M. Spriggs, and Henry G. Lefort. 2 Mar 65 Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Adhesives, Ceramic materials), (*Ceramic materials, Adhesives), (*Bonded joints, Adhesives), Heat-resistant materials, Honeycomb cores, Sandwich construction, Colloids, Silicon compounds, Dioxides, Water, Sandwich panels, Patents.

The adhesives are useful in forming bonded joints in the honeycomb sandwich type of panel construction used for aircraft and missiles. It consists of 100 parts (by weight) of ceramic frit, 2 parts of colloidal silica and 40 parts of water.

Patent 3,172,855 Div. 14, 4

BARIUM-CALCIUM SULFONATE COMPLEXES AND LUBRICATING COMPOSITIONS CONTAINING SAME.
Patent assigned to Lubrizol Corp., Wickliffe, Ohio,
by James D. Rogers and Carl W. Stuebe. 9 Mar 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Lubricant additives, Complex compounds), (*Sulfonates, Lubricant additives), (*Barium compounds, Sulfonates), (*Calcium compounds, Sulfonates), Phenols, Carbon dioxide, Halides, Alcohols, Oxides, Hydroxides, Zinc compounds, Organic phosphorus compounds, Terpenes, Patents.

Oil soluble, carbonated barium-calcium sulfonate complexes with metal ratios of from 10 to 30 are incorporated in cutting, slushing and lubricating oils. A sulfonate, combined with an alkylated phenol and a barium compound, is treated with carbon dioxide at temperatures of from 120 to 175 degrees C. A calcium compound and a calcium halide and a lower aliphatic monohydric alcohol are then reacted with the sulfonate composition, and more carbon dioxide is introduced at the above temperatures. From 0.1 to 40% by weight of the barium-calcium complex is added to a mineral base oil. The ratio of sulfonate to phenol may range from 1:10 to 10:1.

Patent 3,172,856 Div. 14, 4

COPOLYMERS OF N-ALKYL PIPERAZINE ACRYLATE AND ALKYL ACRYLATE AND LUBRICATING OILS CONTAINING THEM.
Patent assigned to Sinclair Research, Inc., New York, N. Y.
by Elwin B. Ovist and Manley Kjonaas. 9 Mar 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Lubricant additives, Polymers), (*Acrylic resins, Lubricant additives), Oils, Fatty acid esters, Monocyclic compounds, Amines, Copolymerization, Patents.

Oil additives containing an oil-soluble copolymer of lauryl methacrylate and an N-ethyl piperazine methacrylate are incorporated as dispersants and sludge inhibitors in low temperature lubricating oils for spark ignition and diesel engines. The composition consists of a mineral oil of lubricating viscosity containing from 0.1 to 20% by weight of the oil soluble copolymer of an ester of an alkanol of about 10 to 20 carbon atoms and acrylic acid and an N-alkyl piperazine ester of acrylic acid. The ester of acrylic acid and the N-alkyl piperazine ester are in a mol ratio of 75:25 to 99:1, with a nitrogen content of 0.1 to 7%.

Patent 3,173,460 Div. 14, 26

PROCESS FOR REDUCING SPRINGBACK IN PRESSED WOOD PRODUCTS.
Patent assigned to Agriculture,
by Robert A. Hann. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Wood, Stabilization), Particles, Pressure, Patents, Processing, Thickness, Heat treatment, Moisture.

Particle board is exposed to steam at a high pressure while the board is restrained in a restraining zone to prevent thickness swelling. As a result, the board particles absorb moisture and heat, swell internally and achieve a new, stable dimension in the pressed thickness, the temperature and moisture content of the pressed wood product being sufficiently high to promote plastic flow.

Patent 3,173,869 Div. 14

GREASE COMPOSITION.
Patent assigned to Sinclair Research Inc., New York, N. Y.,
William B. Watson and Lewis D. Loring, Jr.
16 Mar 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Greases, Preparation), (*Lubricants, Preparation), Oils, Alkaline earth compounds, Soaps, Fatty acids, Alcohols, Lithium compounds, Stearates, Viscosity, Patents.

A fatty soap grease which utilizes lube distillate fractions from mixed base oils has good texture, oxidation stability, and yield. The grease consists of 65 to 95% by weight of an oil of lubricating viscosity and 5 to 35% of an alkaline earth metal soap of a hydroxy fatty acid having from 10 to 32 carbon atoms. The lubricating oil base is a secondary raffinate of an extract oil, which in itself is a product of an extraction of a lubricating oil having a viscosity index of at least 85. The thickener is lithium 12-hydroxy stearate.

Patent 3,173,870 Div. 14, 4

COPOLYMERS OF DIALKENYL SULFONE AND ETHYLENICALLY UNSATURATED MONOMERS.
Patent assigned to Standard Oil Co., Chicago, Ill.,
by Ellis K. Fields. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Lubricant additives, Polymers), (*Organic sulfur compounds, Lubricant additives), (*Styrene plastics, Lubricant additives), Fatty acid esters, Vinyl plastics, Amines, Oils, Copolymerization, Patents.

Copolymers of dialkenyl sulfones and polymerizable monomers are incorporated as 'detergent-type' additives in automotive and diesel engines. The composition consists of a lubricating oil containing from 0.01 to 10% of an oil soluble copolymer prepared from 1 to 12 weight % of dialkenyl sulfone containing from 2 to 5 carbon atoms, and a polymerizable vinylidine compound present in at least an equal amount to that of the ester. The copolymer also contains a mixture of tertiary alkyl primary amines containing from 12 to 14 carbon atoms in the alkyl group in an amount of from 10 to 120% of the dialkenyl sulfone.

Patent 3,173,871 Div. 14, 4

LUBRICATING OILS CONTAINING BENZALCYCLOHEXYLAMINE AND BIS-PHENOLS.
Patent assigned to Castrol Limited, London (England),
by John Scotchford Elliott. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Lubricant additives, Preparation), (*Antioxidants, Lubricant additives), (*Amines, Lubricant additives), (*Phenols, Lubricant additives), Oils, Cyclohexanes, Aromatic compounds, Marine engines, Lubricants, Patents.

An anti-corrosion and anti-oxidation additive to mineral lubricating oils for marine engines also serves to reduce varnish formation. The composition includes from 0.5 to 1.0% by weight of benzal cyclohexylamine and from 0.3 to 1.0% of an alkyl phenol having at least one secondary or tertiary alkyl substituent in the ortho position to the hydroxyl group. The phenol component may be methylene bis(2,6 di-t-butyl phenol).

Patent 3,173,887 Div. 14, 4

POLYURETHANE FOAMS USING ESTERIFIED DIMER ACIDS.
Patent assigned to Agriculture,
by Thomas E. Yeates and Charles M. Thierfelder.
16 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Expanded plastics, Preparation), (*Isocyanate plastics, Preparation), Vegetable oils, Fatty acid esters, Ethylene oxide, Catalysts, ethylenediamine.

The foamed product is obtained by esterifying a polyunsaturated vegetable oil derived dimer-acid mixture comprising three parts of C36-tribasic acid with from 1 to not more than about 2 mole equivalents of ethylene oxide.

Patent 3,174,827 Div. 14

PRODUCTION OF HIGH PURITY SILICON CARBIDE.
Patent assigned to NASA,
by Noel T. Wakelyn and Robert A. Jewell. 23 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Carbides, Crystals), (*Silicon compounds, Carbides), Production, Patents, Manufacturing methods, Controlled atmospheres, Hydrogen, Chlorides, Furnaces, Crystal growth, Graphite.

High purity silicon carbide crystals are produced by heating a graphite model within an inert atmosphere furnace cavity to 4,000 degrees F. Hydrogen gas, previously saturated with silicon tetrachloride, is flowed through a constriction onto the model for about an hour at 4,000 degrees F. The furnace is then purged with an inert gas while increasing the temperature to 4,600 degrees F. The furnace and model are then cooled.

Patent 3,174,930 Div. 14, 4

METHOD OF PREPARING AN ALUMINUM OXIDE GEL AND LUBRICATING COMPOSITIONS THEREOF.
Patent assigned to Warren Refining and Chemical CO.,
Cleveland, Ohio.
by Vivian R. Damerell. 23 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Lubricants, Preparation], (*Greases, Gels), Solubility, Penetration, Compatibility, Alkali metal compounds, Carbonates, Fatty acids, Aluminum compounds, Sulfates, Surface-active substances, Mineral oils, Oxides, Viscosity, Patents.

An aluminum oxide hydrate gel, derived from a basic aluminum sulfate-carbonate hydrogel, is added to mineral oil base greases to improve penetration value, dropping point, water-insolubility, and compatibility with other greases. Aluminum sulfate in aqueous solution is heated to temperatures from 35 to 95 degrees C., and an alkali metal carbonate is added in a ratio of 1:1, based on equivalent weights. The composition is dried at temperatures to 165 degrees C., and then heated to temperatures to 600 degrees C. The resulting aerogel is mixed with an amino fatty acid surfactant of at least 12 carbon atoms. From 1 to 35% by weight of the alumina hydrate, with 1 to 20% of a hydrophobic surface active agent, was incorporated in a mineral oil having a viscosity of from 60 S.U.S. at 100 degrees F. to 150 S.U.S. at 210 degrees F. to obtain a grease product.

Patent 3,175,931 Div. 14, 17, 20

TREATMENT OF ALUMINUM SURFACES.
Patent assigned to AEC,
by Carl A. Burgess and John D. Schaffer.
30 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Coatings, Reactor fuel elements), (*Aluminum alloys, Coatings), (*Containers, Reactor fuel elements), Patents, Uranium, Corrosion inhibition, Silicon alloys, Surfaces, Alkali metal compounds, Oxides, Silicon compounds, Dioxides, Protective treatments, Surface properties.

Uranium fuel elements are coated with aluminum-base metal to protect against corrosion. The surface is treated to make it nonwettable by molten aluminum-silicon alloys. An aqueous solution of alkali metasilicate is applied to the metal surface. The solution contains equimolar quantities of alkali metal oxide and silica.

PB-167 198 Div. 14, 8
CFSTI Prices: HC$2.00 MF$0.50

Houghton Labs., Inc., Olean, N. Y.
RESEARCH STUDY FOR IMPROVEMENT OF INSULATING COATINGS FOR PRINTED CIRCUITRY.
Quarterly progress rept. no. 7, 1 Aug-31 Oct 56,
by Mark V. Goodyear and Donald W. Rice. 31 Oct 56, 36p
Contract DA36 039sc64608, Proj. 3 93 00 500
AD 204 754

Unclassified report

See also PB-160 745.

Descriptors: (*Printed circuits, Electric insulation), (*Plastic coatings, Printed circuits), (*Epoxy plastics, Electric insulation), Copper, Foils, Paper, Phenolic plastics, Laminates, Aging (Materials), Fracture (Mechanics), Storage, Degradation, Vibration, Thermal properties.

An investigation was made of epoxy resins as protective coatings on XXXP etched copper foil clad paper base phenolic laminates. The amount of resiliency or flexibility incorporated into the HYSOL 6230 system with the use of 15% Paraplex G-60 was not sufficient. The coating cracked during vibration. Efforts to flexibilize HYSOL 6230A and Hardener AT-130A has been unsuccessful to date. The material has proved to be brittle at low temperatures. HYSOL 6020-125 and Hardener AK-4 appeared to withstand low temperature conditions satisfactorily. The workable pot life is relatively short, i.e., 2 1/2-3 hours, but can be extended indefinitely by replenishment at regular intervals. Further evaluation of this material is proceeding at this time.

15. Mathematics

PB-167 001 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
TACTICAL CONFIGURATIONS II. CONSTRUCTION OF CERTAIN TACTICAL CONFIGURATIONS,
by Haim Hanani. Oct 60, 11p
Technical summary rept. no. MRC-TSR-174
Contract DA11 022ORD2059
AD 247 393

Unclassified report

Descriptors: (*Combinatorial analysis, Configuration), Algebra, Set theory.

PB-167 009 Div. 15, 25
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
PREDICTIVE DECOMPOSITION INTO MARKOV AND PASSIVE COMPONENTS,
by Enders A. Robinson. Dec 59, 17p
Technical summary rept. no. MRC-TSR-126
Contract DA11 022ORD2059
AD 231 355

Unclassified report

Descriptors: (*Statistical analysis, Electric filters), (*Electric filters, Statistical analysis), Electrical networks, Time, Series, Least squares method, Integral transforms.

Let x(t) be a stationary time series with a known rational spectral density that does not vanish for any real frequency. The least-squares prediction of x(t+E), E>0, is decomposed into two components: the Markov component and the passive component. The Markov component is a weighted average of x(t) and its derivatives, all evaluated at the present time instant t. The passive component is a convolution integral involving the whole past x(T), T<t, of the time series. The methods of electric filter theory are used throughout the paper. (Author)

PB-167 010 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
TURNING POINTS IN LINEAR ASYMPTOTIC THEORY,
by Rudolph E. Langer. Dec 59, 22p
Technical summary rept. no. MRC-TSR-127
Contract DA1 022ORD2059
AD 231 356

Unclassified report

Descriptors: (*Differential equations, Theory), Power series, Operators (Mathematics), Polynomials.

Linear ordinary differential equations are considered. The asymptotic solution forms are obtained by the method which depends upon a derivation of formal solutions, i. e., which fulfill the differential equation term by term, but which may not be actual solutions because they happen to diverge. Truncations of these formal solutions are free of the stigma of divergence, but do not fulfill the given equation in more than an approximate sense. A proof is given that the formal solution truncations do represent true solutions asymptotically, but have validity only for suitable delimited sub-domains of the parameter lambda and the domain z.

PB-167 015 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
A REGULARITY CONDITION FOR A CLASS OF PARTITIONED MATRICES,
by A. M. Ostrowski. Jan 60, 8p
Technical summary rept. no. MRC-TSR-132
Contract DA11 022ORD2059
AD 232 860

Unclassified report

Descriptors: (*Matrix algebra, Combinatorial analysis), (*Combinatorial analysis, Matrix algebra), Theorems.

PB-167 017 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
SOME CHARACTERIZATIONS OF A CLASS OF UNAVOIDABLE COMPACT SETS IN THE GAME OF BANACH AND MAZUR,
by H. Hanani and M. Reichbach. Mar 60, 25p
Technical summary rept. no. MRC-TSR-134
Contract DA11 022ORD2059
AD 235 840

Unclassified report

Descriptors: (*Game theory, Set theory), (*Set theory, Game theory), Functional analysis, Topology.

The Mazur-Banach game is generalized by introducing a game constant k, k > 0. Only closed subsets of (0, 1) are considered. Banach posed the problem of finding necessary and sufficient conditions which make a set S unavoidable. For every k > 1, sufficient conditions are found for an arbitrary compact set S to be unavoidable for the constant k. These conditions are also necessary if the following condition is stipulated: a uniform structure (from the point of view of the game) of the set S is implied. Under this restriction, a solution of the problem of Banach in the case of compact sets is given. A numerical solution of the problem of Banach for sets belonging to the Canter class C is given. (DDC Abstract)

PB-167 018 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
SYSTEMS-DISCONJUGACY OF A FOURTH-ORDER DIFFERENTIAL EQUATION,
by John H. Barrett. Feb 60, 14p
Technical summary rept. no. MRC-TSR-135
Contract DA11 022ORD2059
AD 233 614

Unclassified report

Descriptors: (*Differential equations, Theory), Matrix algebra.

PB-167 022 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
TWO-POINT BOUNDARY VALUE PROBLEMS AND COMPARISON THEOREMS FOR FOURTH-ORDER SELF-ADJOINT DIFFERENTIAL EQUATIONS AND SECOND-ORDER MATRIX DIFFERENTIAL SYSTEMS,
by John H. Barrett. Apr 60, 21p
Technical summary rept. no. MRC-TSR-150
Contract DA11 022ORD2059
AD 239 424

Unclassified report

Descriptors: (*Boundary value problems, Differential equations), (*Differential equations, Theorems), (*Matrix algebra, Differential equations), Transformations (Mathematics).

PB-167 025 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
MAIN EFFECTS AND INTERACTIONS,
by Henry B. Mann. Sep 60, 34p
Technical summary rept. no. MRC-TSR-182
Contract DA11 022ORD2059
AD 245 952

Unclassified report

Descriptors: (*Combinatorial analysis, Factor analysis), (*Factor analysis, Combinatorial analysis), Analysis of variance, Calculus of variations.

In a factorial experiment on two factors, each factor is applied on varying levels to various experimental units. Assuming that this application yields for each unit a quantity, the author calls this the yield of the unit, and further denotes by f(x,y) the mean value of the yield obtained when the first factor is applied at level x and the second at level y.

PB-167 026 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
TACTICAL CONFIGURATIONS, I. INCOMPLETE BALANCED BLOCK DESIGNS,
by Haim Hanani. Feb 60, 47p
Technical summary rept. no. MRC-TSR-137
Contract DA11 022ORD2059
AD 234 799

Unclassified report

Descriptors: (*Combinatorial analysis, Configurations), Algebra, Set theory, Number theory.

Given a set E of v elements, a tactical configuration is an arrangement of these elements in b blocks, which are subsets of E having k elements each, in such a way that all the subsets of E having 1 elements (1 < k < v) occur equally often. In an incomplete balanced block design, v elements are arranged into b blocks of k distinct elements each, so that every element occurs in r blocks and every pair of elements occur lambda times in all.

PB-167 027 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
FITTING EMPIRICAL DATA,
by George E. P. Box. May 60, 45p
Technical summary rept. no. MRC-TSR-151
Contract DA11 022ORD2059
AD 239 425

Unclassified report

Descriptors: (*Statistical data, Curve fitting), (*Curve fitting, Statistical data), Experimental data, Least squares method, Errors.

Contents:
The dual problems of design and analysis
The analysis of experimental data
Linear least squares
Reasons for the importance of linear least squares
Non-linear least squares
The Princeton IBM 704 programme
Fitting a set of simultaneous differential equations by least squares
Choice in generation of experimental data
Designs for fitting graduating polynomials
Designs for minimizing variance error
Designs for minimizing bias as well as variance error
Designs for fitting theoretical functions non-linear in the parameters.

PB-167 028 Div. 15
CFSTI Prices: HC$3.00 MF$0.75

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON SOME METRICAL PROPERTIES OF OPERATOR MATRICES AND MATRICES PARTITIONED INTO BLOCKS,
by A. M. Ostrowski. Mar 60, 66p

Technical summary rept. no. MRC-TSR-138
Contract DA11 022ORD2059
AD 237 136

Unclassified report

Descriptors: (*Matrix algebra, Operators (Mathematics)), (*Operators (Mathematics), Matrix algebra), (*Combinatorial analysis, Matrix algebra), Determinants, Functional analysis.

Contents:
General norms in linear and composite spaces
Bounds for linear operators in linear spaces
Bounds and eigenvalues of composite operators
Bounds for the determinants of partitioned matrices
Lower bounds for determinants of partitioned matrices
Use of M-determinants.

PB-167 029 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
A NOTE ON STEINER TRIPLE SYSTEMS,
by Haim Hanani. Feb 60, 6p
Technical summary rept. no. MRC-TSR-139
Contract DA11 022ORD2059
AD 233 615

Unclassified report

Descriptors: (*Number theory, Algebra), (*Algebra, Number theory), Set theory.

Given a set E of e elements, an arrangement of the elements of E in triples is denoted by Steiner triple system in such a way that each pair of elements is contained in exactly one triple. A necessary and sufficient condition for the existence of a Steiner triple system is that e = 1 or 3 (mod 6). The number of the triples in such system is 1/6 e(e-1). A new method of construction of Steiner triple systems in the case e = 6t + 1 is given. (Author)

PB-167 030 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ISOPERIMETRIC INEQUALITIES FOR TWO-DIMENSIONAL RIEMANNIAN MANIFOLDS,
by Chuan-Chih Hsiung. Feb 60, 14p
Technical summary rept. no. MRC-TSR-140
Contract DA11 022ORD2059
AD 233 616

Unclassified report

Descriptors: (*Inequalities, Complex variables), (*Algebraic topology, Inequalities), Functional analysis.

For a simple closed rectifiable plane curve C of length L and enclosed area A, the isoperimetric inequality states that L-squared > or = 4Api, where the equality holds if and only if C is a circle. The inequality is extended to the most general 2-dimensional Riemannian manifolds with boundary, which can be imbedded in a Euclidean space E sub N + 2 of dimension N + 2 for any N > 0. (Author)

PB-167 034 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
BOUNDS FOR SOLUTIONS OF NONLINEAR DIFFERENTIAL SYSTEMS,
by Michael Golomb. Dec 57, 21p
Technical summary rept. no. MRC-TSR-16
Contract DA11 022ORD2059
AD 156 499

Unclassified report

Descriptors: (*Nonlinear differential equations, Inequalities), (*Inequalities, Integrals), Matrix algebra, Functional analysis.

Bounds are established for solutions of differential systems of the form dx/dt = A(t) x +F(t, x(t)) with various kinds of nonlinearities, some that increase slower than the linear terms, A(t)x, when the norm of x becomes very large and others that decrease faster than the linear terms when the norm of x approaches zero. In each case, the bounds are derived from bounds to the general solution of the linear part assumed as known. In the case of (relatively) slowly increasing nonlinear terms, F(t, x(t)), the bounds hold for solutions with large initial values; in the case of (relatively) rapidly decreasing nonlinear terms the bounds are valid for solutions with small initial values. The bounds reflect at least the growth of the various terms involved and are rather sharp for some equations. The bounds are developed from the solution of a nonlinear integral inequality. The solution is an extension of a result for the corresponding linear integral inequality.

PB-167 036 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON SOME MATRIX THEOREMS OF LAX,
by H. F. Weinberger. Jan 58, 5p
Technical summary rept. no. MRC-TSR-18
Contract DA11 022ORD2059
AD 156 732

Unclassified report

Descriptors: (*Matrix algebra, Theorems), Real numbers, Functional analysis, Determinants.

The main purpose of the report is to show how some of Lax's theorems on the eigenvalues of matrices can be proved algebraically within the framework of matrix theory.

PB-167 038 Div. 15
CFSTI Prices: HC$3.00 MF$0.75

Mathematics Research Center, Univ. of Wisconsin, Madison.
FORMAL SOLUTIONS AND A RELATED EQUATION FOR A CLASS OF FOURTH ORDER DIFFERENTIAL EQUATIONS OF A HYDRODYNAMIC TYPE,
by Rudolph E. Langer. Feb 58, 61p
Technical summary rept. no. MRC-TSR-22
Contract DA11 022ORD2059
AD 161 979

Unclassified report

Descriptors: (*Differential equations, Theory), Power series, Complex numbers, Functions, Hydrodynamics.

PB-167 040 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.

ON THE DERIVATIVES OF BESSEL FUNCTIONS WITH RESPECT TO THE ORDER,
by F. Oberhettinger. Apr 58, 10p
Technical summary rept. no. MRC-TSR-26
Contract DA11 022ORD2059
AD 161 819

Unclassified report

Descriptors: (*Bessel functions, Partial differential equations), (*Partial differential equations, Bessel functions), Transcendental functions, Integrals, Special functions (Mathematical), Series.

Cases are investigated where the derivative of one of the Bessel functions Y sub v(z) or modified Bessel functions I sub v(z) with respect to the order v reduces to one of the more thoroughly investigated higher transcendental functions. The investigation is restricted to the modified Hankel function K sub v(z). The cases for v = ± n and for v = ± (n+1/2) are considered.

PB-167 042 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
PERSISTENCE OF AN EFFECT OF A SUCCESS IN A BERNOULLI SEQUENCE,
by P. M. Anselone. Oct 58, 15p
Technical summary rept. no. MRC-TSR-44
Contract DA11 022ORD2059
AD 207 321

Unclassified report

Descriptors: (*Statistical distributions, Analysis), Sequences, Probability, Stochastic processes.

The Bernoulli distributions are analyzed for the lengths of the runs of ones and zeros, the number of runs in a fixed number of trials, and certain asymptotic and ergodic properties. The methods of analysis depend strongly on the discrete character of the random variables involved. (Author)

PB-167 043 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
TWO-DIMENSIONAL AUTONOMOUS SYSTEMS OF DIFFERENTIAL EQUATIONS WITH A FIRST INTEGRAL,
by Oswald Wyler. Oct 58, 30p
Technical summary rept. no. MRC-TSR-45
Contract DA11 022ORD2059
AD 207 322

Unclassified report

Descriptors: (*Differential geometry, Differential equations), (*Differential equations, Integrals), Theory.

A geometry of orbits is studied for an autonomous system x = f(x, y), y = g(x, y) of the undamped type. A theorem is proved which shows that a autonomous system with a finite number of critical points is of the undamped type if and only if, all but a finite number of orbits of the system are closed curves. A variant is developed of the poincare-Bendixson theory which is adapted to systems with this property. This theory is then used to study the pattern of open-arc orbits and critical points of a system of undamped type. These results are used to obtain a complete geometric theory for such a system. (DDC Abstract)

PB-167 046 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
OVERRELAXATION FOR NON-LINEAR ELLIPTIC PARTIAL DIFFERENTIAL PROBLEMS,
by H. M. Lieberstein. Mar 59, 13p
Technical summary rept. no. MRC-TSR-80
Contract DA11 022ORD2059
AD 218 479

Unclassified report

Descriptors: (*Partial differential equations, Iterative methods), (*Iterative methods, Partial differential equations), Nonlinear differential equations, Matrix algebra, Boundary value problems.

Overrelaxation techniques of D. M. Young (AD-30 296) for a large class of practical linear partial differential problems are generalized so that they are directly applicable to non-linear problems. (Author)

PB-167 047 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
SINGULARITY OCCURRENCE AND STABLY POSED PROBLEMS FOR ELLIPTIC EQUATIONS,
by H. M. Lieberstein. Apr 59, 22p
Technical summary rept. no. MRC-TSR-81
Contract DA11 022ORD2059
AD 218 480

Unclassified report

Descriptors: (*Partial differential equations, Theory), Perturbation theory, Functions, Real numbers, Boundary value problems.

A study is made which discusses the similarity between the theories of singularity propagation for hyperbolic equations and the theory of singularity occurrence for elliptic equations. The effect of a singularity in the complex extension of the derivative data is shown to cancel the effect in the primitive data in either its forward or rearward propagation. This cancellation cannot take place in both directions. (DDC Abstract)

PB-167 050 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ., of Wisconsin, Madison.
A CONJECTURE OF R. NEVANLINNA CONCERNING THE GENUS OF A MEROMORPHIC FUNCTION,
by Albert Edrei and S. M. Shah. Apr 59, 8p
Technical summary rept. no. MRC-TSR-88
Contract DA11 022ORD2059
AD 218 613

Unclassified report

Descriptors: (*Functions, Complex variables), (*Inequalities, Functions), Integrals, Series, Algebra.

Nevanlinna's conjecture on the genus of a meromorphic function is disproved by constructing an entire function f(z) of order 1. Let f(z) be a meromorphic function of finite order lambda and genus q. Write g(f) = q, and denote by g(h) the genus of h(z). The order is invariant under differentiation. If lambda is not a positive integer, g(f) = (lambda); hence g(f') = g(f). For positive values of lambda, g(f') = < or = g(f). Let d(a, f) denote the deficiency of the value a, with respect to f, and let d'(f) be the total

deficiency of f(z): d'(f) = summation over all a of d(a, f). After examining the inequality and its connections with the notion of deficiency, Nevanlinna conjectured that g(f') < g(f) implies d'(f) = 2. An entire function f(z) of order 1 is constructed for which this conjecture holds as well as the summation of d(a,f) over a = O, where a is not infinity. If m, m > 1, is an integer and f(z to the m th power) is considered, functions of order m are obtained for which both conjectures hold simultaneously. (DDC abstract)

PB-167 052 Div. 15
CFSTI Prices: HC$3.00 MF$0.75

Mathematics Research Center, Univ. of Wisconsin, Madison.
ASYMPTOTIC FACTORIAL EXPANSIONS,
by J. G. van der Corput. Jun 59, 60p
Technical summary rept. no. MRC-TSR-91
Contract DA11 022ORD2059
AD 220 380

Unclassified report

Descriptors: (*Series, Special functions (Mathematical)), (*Special functions (Mathematical), Series), Integrals, Polynomials, Functional analysis.

A sum is extended over the integers m > or = O. A series of the form a sub m (gamma (z)/gamma(z+m+1)) with constant coefficients a sub m is a factorial series of the first kind. Such a series can be used in asymptotics, since for each positive constant b the series converges in the sector -pi + b < arg z < pi - b asymptotically for large absolute value of z.

PB-167 054 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON AN IDENTITY OF BLOCK AND MARSCHAK,
by J. G. van der Corput. Jun 59, 5p
Technical summary rept. no. MRC-TSR-93
Contract DA11 022ORD2059
AD 220 551

Unclassified report

Descriptors: (*Identities, Permutations), Functions, Series, Number theory.

PB-167 058 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
THE LOCATION OF THE INVARIANT MANIFOLD FOR A PERTURBED AUTONOMOUS SYSTEM,
by W. S. Loud. Apr 60, 31p
Technical summary rept. no. MRC-TSR-153
Contract DA11 022ORD2059
AD 237 138

Unclassified report

Descriptors: (*Perturbation theory, Differential geometry), Calculus of variations, Vector analysis, Invariance, Matrix algebra.

The perturbed system (dx/dt) = g(x) + Ef(t,x,E), where f(t,x,E) has least period T in t is considered. If g(x) and f(t,x,E) are in C(3), there exists, for sufficiently small E, a surface S:x = H(t,theta,E) in x-t spaces lying near the cylinder x = x sub i(t), i = 0, which is an invariant manifold for the perturbed system. Any solution of the system which is on S at any time is on S for all time. Also, when k = n-1, S is stable in that all solutions of the perturbed system which at some time are sufficiently close to the surface, actually approach it asymptotically as t approaches infinity.

PB-167 059 Div. 15, 25
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
A TURNING POINT PROBLEM FOR A SYSTEM OF TWO LINEAR DIFFERENTIAL EQUATIONS,
by Wolfgang Wasow. Feb 59, 38p
Technical summary rept. no. MRC-TSR-71
Contract DA11 022ORD2059
AD 212 056

Unclassified report

Descriptors: (*Differential equations, Theory), Matrix algebra, Series, Transformations (Mathematics), Hamiltonian, Integration.

PB-167 060 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON THE REDUCIBILITY OF CERTAIN LINEAR DIFFERENTIAL SYSTEMS,
by Michael Golomb. Dec 59, 27p
Technical summary rept. no. MRC-TSR-120
Contract DA11 022ORD2059
AD 232 856

Unclassified report

Descriptors: (*Differential equations, Theory), Real variables, Complex variables, Matrix algebra, Transformations (Mathematics), Series.

PB-167 062 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
SOME SINGULAR CASES OF THE IMPLICIT FUNCTION THEOREM,
by W. S. Loud. Oct 60, 26p
Technical summary rept. no. MRC-TSR-181
Contract DA11 022ORD2059
AD 247 400

Unclassified report

Descriptors: (*Differential equations, Theorems), Matrix algebra, Functions, Partial differential equations.

Let F(x,y,z) and G(x,y,z) have a sufficient number of continuous partial derivatives in some neighborhood of (0,0,0). Let F(0,0,0) = G(0,0,0) = 0. It is desired to find x and y as functions of z from F(x,y,z) = 0, G(x,y,z) = 0, where at z = 0, x = 0, y = 0, and the derivatives dx/dz and dy/dz are finite.

PB-167 063 Div. 15
CFSTI Prices: HC$3.00 MF$0.75

Mathematics Research Center, Univ. of Wisconsin, Madison.
THEORY OF ERRORS IN NUMERICAL INTEGRATION OF ORDINARY DIFFERENTIAL EQUATIONS,
by Minoru Urabe. Oct 60, 91p

Technical summary rept. no. MRC-TSR-183
Contract DA11 022ORD2059
AD 247 299

Unclassified report

Descriptors: (*Differential equations, Integration), (*Integration, Differential equations), Numerical analysis, Errors, Difference equations.

Three problems concerning errors in numerical integration of ordinary differential equations are studied. The problem of stable convergence is completely solved in a unified form for three representative integration formulas including not only the usual multi-step formulas but also compound-multi step formulas and general Runge-Kutta formulas. The problem of the propagation of errors is studied for general differential equations in a unified form for the three integration formulas. The problem of a new estimate of errors is derived also in a unified form for the three integration formulas. The difference equations which are satisfied by the errors of the numerical solution formulas are first derived. These are then rewritten as a sumultaneous system of equations of first order. In the sequel, by analysis of this system by means of the theory of matrices, the three problems concerning errors are discussed. (DDC Abstract)

PB-167 070 Div. 15, 25
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON SOLUTIONS OF THE HELMHOLTZ EQUATIONS IN EXTERIOR DOMAINS,
by Philip Hartman and Calvin Wilcox. Mar 60, 39p
Technical summary rept. no. MRC-TSR-149
Contracts DA11 022ORD2057, AF18 603 41
AD 237 137

Unclassified report

Descriptors: (*Differential equations, Special functions (Mathematical), Functional analysis, Set theory, Complex numbers, Topology, Electromagnetic waves.

PB-167 071 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
NEW MIXED PROBLEMS FOR HYPERBOLIC SYSTEMS IN THE PLANE,
by Walter Littman. Mar 60, 15p
Technical summary rept. no. MRC-TSR-148
Contract DA11 022ORD2059
AD 235 844

Unclassified report

Descriptors: (*Boundary value problems, Partial differential equations), (*Partial differential equations, Boundary value problems), Functional analysis.

PB-167 072 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
AN EIGENVALUE PROBLEM RELATED TO STABILITY QUESTIONS IN PERTURBED AUTONOMOUS SYSTEMS,
by Warren S. Loud. Mar 60, 25p
Technical summary rept. no. MRC-TSR-147
Contract DA11 022ORD2059
AD 235 843

Unclassified report

Descriptors: (*Matrix algebra, Differential equations), (*Differential equations, Matrix algebra), Determinants, Series, Harmonic analysis, Perturbation theory.

Let D be a real n x n matrix, and let E be a small real parameter. Consider the matrix A(E) given by A(E) = A (I + ED + o(E), where A is a n x n matrix having I as an eigenvalue of order k. Of the n eigenvalues of A(E), k will reduce as E approaches 0 to +1. The dependence on E of those k eigenvalues of A(E) which reduce to +1 as E approaches 0 is investigated. The k critical eigenvalues of A(E) can then be written in the form of positive rational numbers p sub j and general complex numbers a sub j. In the simplest case, p sub j and a sub j are found to be determined completely by a certain m x m minor of the matrix D, completely independent of the matrix B, and of the higher order terms in A(E). In other cases, the a sub j and p sub j depend on the remaining elements of D, on B, and on some of the higher order terms. The exponents p sub j are determined by the Newton polygon associated with the double series in powers of E and (L-1) for the determinant G(E,L) = det (A(E) -LI). (Author)

PB-167 073 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ITERATIVE SOLUTION OF LINEAR SYSTEMS OF FUNCTIONAL EQUATIONS,
by A. M. Ostrowski. Mar 60, 30p
Technical summary rept. no. MRC-TSR-146
Contract DA11 022ORD2059
AD 235 842

Unclassified report

Descriptors: (*Iterative methods, Equations), (*Equations, Iterative methods), Matrix algebra, Functional analysis.

Consider a linear algebraic system AE = H, where A is a matrix, and E and H are vectors in two N-dimensional spaces. In iterative methods, single equations and single groups of equations are used in a conveniently chosen order. A fixed grouping of the equations of the algebraic system and of the corresponding components of the vectors E and H are considered. The N-dimensional spaces are systematically considered as Cartesian products of n linear vector spaces.

PB-167 074 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON THE EIGENVECTOR BELONGING TO THE MAXIMAL ROOT OF A NON-NEGATIVE MATRIX,
by A. M. Ostrowski. Mar 60, 11p
Technical summary rept. no. MRC-TSR-145
Contract DA11 022ORD2059
AD 235 841

Unclassified report

Descriptors: (*Matrix algebra, Theory), Permutations.

Improved estimates are given of the values for gamma = Max x sub n/Min x sub n for positive matrices, where Sxsubn = the summation from n=1 to n=T of (a sub mn x sub n), where (m = 1,..., T).

PB-167 078 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.

SOME INEQUALITIES CHARACTERIZING PATH-NUMBERS OF MULTI-COMPONENT SYSTEMS AND STRUCTURES,
by Sam C. Saunders. Feb 60, 30p
Technical summary rept. no. MRC-TSR-216
Contract DA11 022ORD2059
AD 253 143

Unclassified report

Descriptors: (*Inequalities, Numbers), (*Numbers, Inequalities), (*Combinatorial analysis, Inequalities), Polynomials, Vector analysis.

This paper carries out an extensive study of the path numbers of structures (or systems) whose performance, loosely speaking, does not worsen with increasing numbers of components functioning. That is, A sub j is the number of ways such a structure can be made to perform when having exactly j components performing. Being path numbers for some such structure places strong restrictions on the combinatorial growth of the A sub j's. An inequality is found which is a necessary and sufficient condition that a set of numbers form the path numbers of some such structure. This identifies completely the class of polynomials which are the reliabilities of such structures with independent components of the same reliability.

PB-167 080 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
SMALL SAMPLE BEHAVIOR OF SLOPE ESTIMATORS IN A LINEAR FUNCTIONAL RELATION,
by Martin Dorff and John Gurland. Feb 60, 31p
Technical summary rept. no. MRC-TSR-214
Contracts DA11 022ORD2059, AF49 638 43
AD 253 141

Unclassified report

Descriptors: (*Curve fitting, Functional analysis), Errors, Least squares method, Sampling.

The slope parameter is estimated in a linear functional relation between two variables which are not observable since both are subject to error. Such problems occur in many contexts. As a matter of fact, in virtually all applications of fitting a functional relation errors of observation occur in all variables. Very frequently we can neglect errors in the independent variables in comparison with the errors in the dependent variable, but clearly we cannot always do so. In particular, it is often desirable to use a relatively inexpensive technique in place of a very costly one, where the results given by the two, apart from errors, are linearly related. For example, the evaluation of rocket grains by static test techniques is relatively inexpensive compared to the procedure of utilizing dynamic or flight testing. (Author)

PB-167 081 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
LINEAR SYSTEMS OF DIFFERENCE EQUATIONS SOLVABLE BY FACTORIAL SERIES,
by W. A. Harris, Jr. Dec 60, 30p
Technical summary rept. no. MRC-TSR-213
Contract DA11 022ORD2059 Unclassified report
AD 252 720

Descriptors: (*Difference equations, Series), (*Series. Difference equations), S-matrix, Factor analysis, Matrix algebra.

There is a method for linear systems of difference equations corresponding to the method of Frobenius for linear systems of differential equations. This method will yield a fundamental set of formal series solutions which can be shown to converge and hence represent an actual fundamental set. Factorial series will play a part analogous to that of power series in the theory of differential equations. (Author)

PB-167 082 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON AN INEQUALITY OF J. VICENTE GONCALVES,
by A. M. Ostrowski. Dec 60, 7p
Technical summary rept. no. MRC-TSR-210
Contract DA11 022ORD2059
AD 251 407

Unclassified report

Descriptors: (*Inequalities, Polynomials), Algebra, Theory.

PB-167 083 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
SOME METHODS OF ESTIMATION FOR THE POISSON BINOMIAL DISTRIBUTION,
by S. K. Katti and John Gurland. Dec 60, 16p
Technical summary rept. no. MRC-TSR-212
Contract DA11 022ORD2059
AD 252 723

Unclassified report

Descriptors: (*Statistical distributions, Binomials), (*Binomials, Distribution theory), Combinatorial analysis, Series, Determinants, Statistical tests.

Among the methods studied, the minimum chi - square method using the first two factorial cumulants and the logarithm of the zero frequency yields estimators with the highest efficiency.

PB-167 084 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON THE APPROXIMATE SOLUTION OF ELLIPTIC DIFFERENTIAL EQUATIONS WITH MIXED PARTIAL DERIVATIVES,
by Donald Greenspan. Nov 60, 26p
Technical summary rept. no. MRC-TSR-209
Contract DA11 022ORD2059
AD 250 292

Unclassified report

Descriptors: (*Partial differential equations, Numerical analysis), (*Numerical analysis, Partial differential equations), (*Boundary value problems, Partial differential equations), Difference equations, Taylor's series.

An analysis conducted on a large class of equations whose mixed derivative coefficients need not necessarily be zero is considered. The interesting, non-constructive, discussion of Motzkin and Wasow (J. Math. Phys. 31: 253-259, 1953) for such equations will be replaced, for a large class of problems, by a constructive method of

approximation. The departure from currently popular methods is the application of two finite difference analogues on the set of interior grid points. Moreover, these difference analogues are constructed by treating the entire equation at once rather than by substituting separate central difference approximations for the various derivatives of u. Attention is restricted to Dirichlet problems though the technique readily extends to mixed boundary problems and to milding nonlinear problems. (Author)

PB-167 085 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
AN ITERATIVE METHOD FOR SOLVING NONLINEAR INTEGRAL EQUATIONS,
by Hans F. Bueckner. Dec 60, 39p
Technical summary rept. no. MRC-TSR-207
Contract DA11 022ORD2059
AD 252 722

Unclassified report

Descriptors: (*Interative methods, Integral equations), (*Integral equations, Iterative methods), Functional analysis, Operators (Mathematics).

PB-167 086 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON THE APPROXIMATE SOLUTION OF A CLASS OF STRONGLY ELLIPTIC LINEAR DIFFERENTIAL EQUATIONS,
by Donald Greenspan. Nov 60, 24p
Technical summary rept. no. MRC-TSR-206
Contract DA11 022ORD2059
AD 250 291

Unclassified report

Descriptors: (*Partial differential equations, Numerical analysis), (*Numerical analysis, Partial differential equations), Taylor's series, Difference equations, Boundary value problems.

PB-167 087 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
A FITTING PROCEDURE FOR SOME GENERALIZED POISSON DISTRIBUTIONS,
by Robert Shumway and John Gurland. Feb 60, 35p
Technical summary rept. no. MRC-TSR-205
Contracts DA11 022ORD2059, AF49 638 43
AD 253 140

Unclassified report

Descriptors: (*Statistical distributions, Distribution theory), (*Distribution theory, Statistical distribution), Binomials, Probability, Curve fitting, Matrix algebra.

In the application of contagious distributions to sampled populations it becomes necessary to have some method for rejecting models which are not applicable. A commonly used procedure is to reject a distribution which consistently provides a poor fit to data from the population. The recurrence relations ordinarily used to compute probabilities in the fitting procedure for some of these distributions are subject to the following disadvantages: the formulae generally are long and make the computation of the successive probabilities tedious and time consuming since each probability depends on all the preceding ones. This dependence causes errors to accumulate so that a mistake made early in the computations causes all the succeeding probabilities to be in erron. Furthermore, difficulties in the computation of the probabilities make the task of obtaining the maximum likelihood estimates of the parameters an involved process. (Author)

PB-167 088 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
CHANGES OF SIGN IN CUMULATIVE SUMS,
by J. H. B. Kemperman. Oct 60, 41p
Technical summary rept. no. MRC-TSR-204
Contract DA11 022ORD2059
AD 248 828

Unclassified report

Descriptors: (*Combinatorial analysis, Functions), Probability, Measure theory, Stochastic processes, Real numbers, Statistical functions, Series.

A method is presented which in many important special cases yields an explicit formula for generating functions. Such formulae can be found when the polynomial is an exponential polynomial and also when the independent and identically distributed random variables are integral valued. (Author)

PB-167 091 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
MISSING VALUE FORMULAE FOR CERTAIN THREE FACTOR, SECOND ORDER RESPONSE SURFACE DESIGNS,
by Norman R. Draper. Nov 60, 28p
Technical summary rept. no. MRC-TSR-201
Contract DA11 022ORD2059
AD 250 693

Unclassified report

Descriptors: (*Combinatorial analysis, Matrix algebra), Least squares method, Analysis of variance, Factor analysis.

The estimation of missing values in a general design is described and discussed. Particular formulae are provided for the estimation of missing values for seven well-known, three factor, second order response surface designs, with zero to six center points. (Two of the designs are rotatable and five are three level.) A worked example illustrates the use of the formulae in the case of the cube plus octahedron plus one center point second order rotatable design. (Author)

PB-167 092 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ESTIMATION OF THE PARAMETERS OF A LINEAR FUNCTIONAL RELATION,
by Martin Dorff and John Gurland. Oct 60, 24p
Technical summary rept. no. MRC-TSR-200
Contract DA11 022ORD2059
AD 250 692

Unclassified report

Descriptors: (*Analysis of variance, Functional analysis), Curve fitting.

A variety of consistent estimators of the parameters of a linear functional relation has been proposed over the years. Some of these find their basis in least-squares procedures, some in the methods of analysis of variance, some in the method of grouping, and some in diverse other methods. In this analysis a class of estimators suggested originally by the method of grouping is generalized and the asymptotic variance of a number of different types of estimators is considered. As a result, specific recommendations are given regarding a choice among them. (Author)

PB-167 094 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON PERIODIC SOLUTIONS OF THE EQUATION $x + f(x)x + g(x) = 0$ WHICH ARE ALGEBRAIC CURVES,
by J. C. Wilson. Sep 60, 27p
Technical summary rept. no. MRC-TSR-198
Contract DA11 022ORD2059
AD 249 528

Unclassified report

Descriptors: (*Differential equations, Algebraic geometry), Polynomials, Theory.

The problem is attacked of explicitly obtaining periodic solutions of differential equations whose phase plane paths are algebraic curves of a certain type.

PB-167 096 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON SYSTEMS OF LINEAR INEQUALITIES AND MOMENT SEQUENCES,
by Kurt Endl. Aug 60, 24p
Technical summary rept. no. MRC-TSR-196
Contract DA11 022ORD2059
AD 250 691

Unclassified report

Descriptors: (*Inequalities, Sequences), (*Sequences, Inequalities), Series, Transformations (Mathematics), Set theory, Integral equations.

The systems of inequalities are studied for which the constant u = o and R(x) is finite as x approaches zero, i.e., the systems of inequalities whose sets of solutions are given by sets of sequences (u sub n) from zero to infinity = (integral with respect to R(x) from zero to one of x to the L sub n power) from zero to infinity. It is required that o < L sub o < L sub 1 <...< L sub n for L unbounded, and that R(x) be nondecreasing and finite on the closed interval from zero to one with the integral from zero to one of dR(x) = 1. The existence of these systems being assured by Schoenberg's theorem our problem will consist in finding a set of inequalities, which, together with a given set of inequalities will characterize the sequence above.

PB-167 098 Div. 15
CFSTI Prices: HC$3.00 MF$0.75

Mathematics Research Center, Univ. of Wisconsin, Madison.
SINGULAR VOLTERRA INTEGRAL EQUATIONS AND THEIR USE IN ASYMPTOTIC EXPANSIONS,
by A. Erdelyi. Sep 60, 88p
Technical summary rept. no. MRC-TSR-194
Contract DA11 022ORD2059
AD 251 403

Unclassified report

Descriptors: (*Integral equations, Series), (*Series, Integral equations), Nonlinear differential equations, Integration, Special functions (Mathematical).

PB-167 102 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
A NOTE ON THE LOCKING-IN PHENOMENON,
by W. S. Loud. Oct 60, 11p
Technical summary rept. no. MRC-TSR-190
Contract DA11 022ORD2059
AD 247 404

Unclassified report

Descriptors: (*Differential equations, Calculus of variations), (*Calculus of variation, Differential equations), Vector analysis, Theory.

The existence of the locked-in periodic solutions are deduced from the results of a previous paper (Ann. Math. 70:490-529, 1959). Let the real autonomous n-vector system x' equals g(x) have a relatively isolated periodic solution, which is assumed to be strongly orbitally stable. Consider the forced system x' equals g(x) + ef(t,x,e), where f(t,x,e) has a least period in t. For small e, the forced system is known to have solutions of least period near to translation of the relatively isolated periodic solution. The fact that the solution of the least period has the same period as the forcing term is described as the locking-in of the solution with the forcing term. (DDC Abstract)

PB-167 103 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
ON GROUP MEMBERSHIP IN RINGS AND SEMIGROUPS,
by Gerald Losey and Hans Schneider. Oct 60, 15p
Technical summary rept. no. MRC-TSR-189
Contract DA11 022ORD2059
AD 247 403

Unclassified report

Descriptors: (*Groups (Mathematics), Rings), (*Algebra, Groups (Mathematics)), Algebraic topology, Set theory.

It is shown that if R is a semigroup or associative ring, a group G in R is a subset of R which is a group under the multiplication on R. An element A of R is said to be a group element in R if A belongs to some group in R. The idea of imbedding groups contained in a ring with identity in the group of units of the ring is extended.

PB-167 104 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
GENERAL ASYMPTOTIC EXPANSIONS OF LAPLACE INTEGRALS,
by A. Erdelyi. Oct 60, 39p

Technical summary rept. no. MRC-TSR-188
Contract DA11 022ORD2059
AD 247 402

Unclassified report

Descriptors: (*Integrals, Series), (*Series, Integrals), Integral transforms, Functions, Complex variables.

PB-167 105 Div. 15
CFSTI Prices: HC$3.00 MF$0.75

Mathematics Research Center, Univ. of Wisconsin, Madison.
PERIODIC SOLUTIONS OF PERTURBED SECOND-ORDER AUTONOMOUS EQUATIONS II,
by W. S. Loud. Nov 60, 80p
Technical summary rept. no. MRC-TSR-187
Contract DA11 022ORD2059
AD 250 290

Unclassified report

Descriptors: (*Perturbation theory, Differential equations), (*Differential equations, Perturbation theory), Calculus of variations, Matrix algebra.

PB-167 106 Div. 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
TURNING POINT PROBLEMS FOR CERTAIN SYSTEMS OF LINEAR DIFFERENTIAL EQUATIONS,
by Wolfgang Wasow. Oct 60, 48p
Technical summary rept. no. MRC-TSR-184
Contract DA11 022ORD2059
AD 247 401

Unclassified report

Descriptors: (*Differential equations, Theory), Matrix algebra, Series, Transformations (Mathematics).

PB-167 107 Div. 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
THE UNIFORM CONVERGENCE OF CHANDRASEKHAR'S APPROXIMATIONS IN THE CLASSICAL TRANSFER PROBLEM,
by Philip M. Anselone. Oct 59, 6p
Technical summary rept. no. MRC-TSR-97
Contract DA11 022ORD2059
AD 228 711

Unclassified report

Descriptors: (*Numerical analysis, Transport properties), Functions, Series, Sequences, Theory.

Proof is presented of the following theorem: Let I(t,u) and J(t) denote the intensity and average intensity in a semi-infinite, plane-parallel, purely isotropically scattering atmosphere with constant net flux F. Let I sub m(t,u) and J sub m (t), m > or = 1, denote the Chandrasekhar approximations to I(t,u) and J(t) based on either the Gauss or the double Gauss quadrature formula. As m increases, I sub m(t,u) approaches I(t,u) uniformly for 0 < or = t < infinity and -1 < or = u < or = 1, J sub m(t) approaches J(t) uniformly for O < or = t < infinity, and q sub m (t) approaches q(t) uniformly for O < or = t < or = infinity. (Author)

16. Medical Sciences

No Entries

17. Metallurgy

Patent 3,174,851 Div. 17

NICKEL-BASE ALLOYS.
Patent assigned to Navy,
by William J. Buehler and Raymond C. Wiley.
23 Mar 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Nickel alloys, Titanium alloys), (*Titanium alloys, Nickel alloys), Oxidation, Paramagnetic materials, Hot working, Heat treatment, Patents.

The structural alloys have high strength and good oxidation resistance. The alloy contains from 50 to 70 percent nickel, by weight, and 30 to 50 percent of titanium. The alloy is paramagnetic and may be hot wrought to useable shapes prior to hardening.

18. Military Sciences and Operations

No entries

19. Navigation

Patent 3,172,108 Div. 19, 12

METHOD OF NAVIGATION.
Patent assigned to Navy,
by Frank T. McClure. 2 Mar 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Navigation satellites, Doppler navigation), Doppler systems, Navigation computers, Radio transmitters, Radio receivers, Patents.

The method of navigation utilizes an artificially established earth satellite as a reference for determining the location of an observer in terms of latitude and longitude. The method involves the use of a satellite traveling in an earth orbit of known parameters, a radio transmitter on the satellite for transmitting Doppler signals and a receiver and a computer at the unknown location. The computer is programmed to receive the signals, analyze them and give the location.

PB-166 902 Div. 19, 6
CFSTI Prices: HC$2.00 MF$0.50

Pacific Div., Bendix Corp., North Hollywood, Calif.
ACOUSTIC NAVIGATION SYSTEMS.
27 Mar 64, 44p Rept. no. 92-216-1
Unclassified report

Descriptors: (*Ships, Position finding), (*Sonar beacons, Position finding), Transponders, Transmitter-receivers, Sonar pulses, Sound, Velocity, Frequency, Navigational aids.

The acoustic navigation system was developed by the Pacific Div. of Bendix to permit a ship to reoccupy accurately a position in the open ocean beyond the range of shore-based navigation aids. The equipment employs bottom-mounted transponders with no depth limit to provide positioning accuracies of a few feet. The system can achieve ranges of from five to 15 miles (depending on the transponder used) by transmitting moderate power in the middle frequencies (about 10 kc). This also provides extremely large area coverage. The transponders receive interrogations from a ship and reply once to each interrogation. Shipboard equipment measures the elapsed time between interrogation and reply of each transponder, and this information is used to determine the ship's position relative to the array. The accurate system can be used for oceanographic surveys; submarine navigation for weapon firing; precise reference points where other navigation systems cannot or do not operate; and precise reference points for underwater mining, drilling, installation, search, and recovery operations.

20. Nuclear Physics and Nuclear Chemistry

Patent 3,171,714 Div. 20

METHOD OF MAKING PLUTONIUM OXIDE SPHERES.
Patent assigned to AEC,
by Lerroy V. Jones, Donald Ofte, Philip A. Tucker and Layton J. Wittenberg. 2 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Reactor fuel processing, Plutonium compounds), (*Plutonium compounds, Reactor fuel processing), Nuclear reactors, Oxides, Spheres, Reactor fuels, Manufacturing methods, Patents.

The plutonium oxide spheres are used in nuclear reactor applications. Particles of plutonium oxide are formed and particles of a preselected size are segregated and injected into a high temperature plasma torch zone to rapidly heat the particles to a temperature above their melting point. After passing through the heating zone the particles are passed through an air zone and captured in the form of spheres.

Patent 3,171,715 Div. 20

METHOD FOR PREPARATION OF SPHERICAL THORIUM DICARBIDE AND THORIUM-URANIUM DICARBIDE PARTICLES.
Patent assigned to AEC,
by Alfred T. Kleinsteuber. 2 Mar 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Reactor fuel elements, Graphite), (*Thorium compounds, Carbides), (*Uranium compounds, Carbides), Preparation, Spheres, Particles, Oxides, Nitrates, Carbon tetrachloride, Carbon, Patents.

The thorium dicarbide and thorium-uranium dicarbide in the form of spherical particles are used in graphite-matrix fuel elements. An aqueous thorium oxide sol ion (possibly with uranium also) and carbon is mixed with carbon tetrachloride. The mixture is agitated for form spherical droplets. An alcohol is gradually added to solidify the droplets which are then separated from the liquid phase. The particles are then fired.

Patent 3,171,815 Div. 20

METHOD FOR PREPARATION OF THORIUM DICARBIDE AND THORIUM-URANIUM DICARBIDE PARTICLES.
Patent assigned to AEC,
by James L. Kelly, Orlen C. Dean, and Don E. Ferguson.
2 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Reactor fuel elements, Graphite), (*Thorium compounds, Carbides), (*Uranium compounds, Carbides), Preparation, Particles, Oxides, Nitrates, Carbon, Patents.

The thorium dicarbide and thorium-uranium dicarbide particles are for graphite-matrix fuel elements. The particles are prepared by mixing a nitrate-containing thorium oxide sol having a nitrate-to-thorium molar ration of about .05 to .15 (possibly with uranium also) with finely divided carbon at a carbon-to-thorium molar ratio of at least 4 to 1, converting the resulting mixture to solid particles of a predetermined size and shape and firing the resulting mixture to solid particles of a predetermined size and shape and firing the resulting particles in an inert atmosphere at a temperature of at least 1400 degrees C.

Patent 3,173,757 Div. 20

PURIFICATION OF STRONTIUM SOLUTIONS BY ION EXCHANGE.
Patent assigned to AEC,
by Earl J. Wheelwright, Lane A. Bray, Francis P. Roberts, and Robert L. Moore. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Radioactive waste, Purification), (*Strontium compounds, Radioactive waste), (*Ion exchange, Radioactive waste), Ion exchange resins, Ions, Strontium, Isotopes, Fission products, Patents.

The strontium obtained from radioactive waste solutions (obtained in extraction of dissolver solutions of neutron-irradiated uranium with tributyl phosphate-hydrocarbon mixtures in the Purex process) emits only beta particles and is useful as a topical, remedy in ophthalmology. 'Crude concentrate' strontium solutions are treated by adsorption on, and fractional elution from, cation exchange resins. Dowex 50 may be used as the exchange resin.

Patent 3,173,973 Div. 20

GRAPHITE DISPERSION.
Patent assigned to AEC,
by Marion Clifford Brockway. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Reactor fuel processing, Material forming), (*Graphite, Reactor fuel processing), Uranium compounds, Phosphorus compounds, Oxides, Actinide series compounds, Ceramic coatings, Sprays, Solvents, Binders, Pitch (Material), Spheres, Molding, Heat treatment, Tumbling.

The method relates to a uniform dispersion of oxide ceramic-coated nuclear reactor spheres within a matrix essentially of graphite. The method involves tumbling the spheres, spraying with benzene and a slurry of graphite in a solution of medium coal-tar pitch in benzene, removing the spheres from the tumbling drum, drying and shaping the spheres and baking them under uniaxial pressure.

Patent 3,174,818 Div. 20, 17

REDUCING CORROSION OF STAINLESS STEEL IN HOT NITRIC ACID SOLUTIONS BY ADDING CARBON BLACK OR ELEMENTAL SULFUR TO THE SOLUTION.
Patent assigned to AEC,
by Francis G. Rust. 23 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptrs: (*Stainless steel, Corrosive liquids), (*Nitric acid, Stainless steel), Chromium, Ions, Containers, Sulfur, Carbon black, Reactor fuel processing, Patents.

The corrosive effect toward stainless steel of a boiling nitric acid solution containing dissolved chromium values in the plus six oxidation state is reduced. Carbon black is added to the solution to reduce the corrosion. The stainless steel vessels are used in handling nuclear reactor fuels.

PB-167 109 Div. 20
CFSTI Prices: HC$1.00 MF$0.50

Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
STUDY OF THICK, NUCLEAR-COMPENSATED SILICON DETECTORS (Etude des Detecteurs Epais au Silicium Compense Nucleairement),
by Yves Le Coroller. Feb 1965, 25p CEA-R-2722
Unclassified report

Text in French; Attached Summary in English.

Descriptors: (*Crystal counters, Silicon), (*Silicon, Crystal counters), (*Diodes (Semiconductor), Crystal counters), Thickness, Feasibility studies, Performance (Engineering), Electrical properties, Nuclear spectroscopy, Electrons, Beta particles, Gamma counters, Photoelectric effect, France.

A study was made, from the point of view of realization and performance, of thick nuclear-compensated silicon detectors. After recalling the need for compensation and reviewing the existing methods, a detailed description is given of the controlled realization of thick detectors by nuclear compensation from the theoretical and experimental points of view. The practical precautions which should be observed are given: control of the homogeneity of the starting material, control of the evolution of the compensation, elimination of parasitic processes. The performances of the detectors obtained are then studied: electrical characteristics (current, life-time) on the one hand, detection and spectrometry of penetrating radiations on the other hand. The results show that the compensated diodes having an effective thickness of two millimeters operate satisfactorily as detectors for applied voltages of about 500 volts. The resolutions observed are then about 2 per cent for mono-energetic electrons and about 4 per cent for the gamma; they can be improved by the use of a pre-amplifier of very low background noise. (Author)

PB-167 110 Div. 20, 15
CFSTI Prices: HC$2.00 MF$0.50

Commissariat a l'Energie Atomique, Paris (France).
APPLICATION OF STATISTICAL METHODS TO THE TESTING OF NUCLEAR COUNTING ASSEMBLIES (Application de Methodes Statistiques a l'Essai des Ensembles de Comptage Nucleaire),
by Jean Pierre Gilbert and Georges Friedling.
Apr 65, 42p CEA-R-2725
Unclassified report

Text in French; Attached summary in English.

Descriptors: (*Research reactors, Radiation measurement systems), (*Radiation measement systems, Statistical tests), (*Statistical tests, Radiation measurement systems), Fission products, Statistical functions, Stability, France.

The report describes the application of the hypothesis test theory to the control of the 'statistical purity' and of the stability of the counting batteries used for measurements on activation detectors in research reactors. The principles involved and the experimental results obtained at Cadarache on batteries operating with the reactors PEGGY and AZUR are given. (Author)

PB-167 114 Div. 20
CFSTI Prices: HC$2.00 MF$0.50

Commissariat A l'Energie Atomique, Paris (France).
THE CALVET CALORIMETRIC DOSIMETER (Le Dosimetre Calorimetrique Calvet),
by Jean-Rene Puig and Fulvio Romano.
Mar 65, 33p CEA-R-2768
Unclassified report

Report in French.

Descriptors: (*Dosimeters, Calorimeters), Heterogeneous reactors, Graphite, Beryllium, Operation.

The report describes a dosimeter based on the conduction calorimetry principle, and designed to operate in swimming-pool type nuclear reactors. The properties of the apparatus are as follows: the measurement is independant of the specific heat of the calorimetric elements; each calorimetric element is fitted with an electrical calibration; the apparatus is made up of two independent calorimetric elements; the nature of the calorimetric elements makes it possible to analyse the radiation received; the measurable intensities of the absorbed radiation vary from 4 to 4,000 M/rads per hour; the sensitive part of the apparatus is fitted inside a cylinder 5 cms high and 2 cm in diameter. One pre-

production unit made up of graphite and beryllium cores has been tried out in the reactor Siloe with radiation intensities of about 1 to 2 watts per gram. It absorbed an accumulated dose of 1.2 x 10 to the 12th power rads without any weaknesses appearing. (Author)

21. Nuclear Propulsion

No entries

22. Ordnance

Patent 3,175,525 Div. 22

WATER ACTIVATED GAS BUOYANCY DEVICE.
Patent assigned to Navy,
by Gerrit De Vries. 30 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Gas generating systems, Torpedoes), (*Buoys, Inflatable structures), (*Torpedoes, Recovery), Tests, Underwater, Hydrogen, Lithium compounds, Hydrides, Patents.

The gas buoyancy device is used for recovering a negatively buoyant torpedo, subsequent to the completion of a test run and from a predetermined depth in the sea. The torpedo carries a bag within a cavity. The bag is inflatable. Lithium hydride is used to form hydrogen which drives water from the bag and inflates it.

23. Personnel and Training

No entries

24. Photography and Other Reproduction Processes

Patent 3,174,153 Div. 24

SWEEPING IMAGE MIRROR CAMERA.
Patent assigned to AEC,
by Thure Anderson. 16 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Rotating-mirror cameras, Optics), High-speed cameras, Mirrors, Photographic techniques, Nuclear physics, Patents.

The camera is for photographing high speed events, and is especially useful for the scientific study of nuclear phenomena. The camera housing encloses a system of two curved mirrors for reflecting light. This light emanates or is reflected from an object to be photographed, through the mirrors into a film drum having disposed therein a high speed rotor mirror. The light received upon the rotor mirror is projected therefrom onto a photosensitive film disposed in an arc within the cylindrical drum. The fast rotor mirror enables the reflected light image to be swept along an arc length of the film at a high velocity during the instant film recording interval.

25. Physics

Patent 3,174,130 Div. 25, 30

MAGNETOSTRICTIVE FLEXURAL-MODE ELECTROMECHANICAL TRANSDUCER.
Patent assigned to Navy,
by Ralph S. Woollett. 16 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Electromechanical converters, Transducers), (*Transducers, Magnetostrictive elements), (*Magnetostrictive elements, Transducers), Electroacoustic transducers, Sound generators, Patents.

The electromechanical transducer generates high intensity sonic power in the lower part of the audio frequency band. It operates in fluid mediums such as sea water. Two rigid elements, one or both of which are of magnetostrictive material and that are relatively long compared to their transverse dimensions are rigidly joined together alongside one another. A magnetic field causes the elements to undergo flexural distortion. A large amplitude ouput is obtainable from the transducer.

PB-167 005 Div. 25, 15
CFSTI Prices: HC$3.00 MF$0.75

Mathematics Research Center, Univ. of Wisconsin, Madison.
ANTIPLANE ELASTIC SYSTEMS III ISOTROPIC BEAMS,
by L. M. Milne-Thomson. Oct 60, 54p
Technical summary rept. no. MRC-TSR-178
Contract DA11 022ORD2059
AD 247 397

Unclassified report

Descriptors: (*Elasticity, Beams (Structural)), (*Beams (Structural), Elasticity), Prismatic bodies, Cylindrical bodies, Boundary vale problems, Stresses, Loading (Mechanics).

The general antiplane problem is considered for isotropic (prismatic or cylindrical) beams and the cases of extension, bending by couples and push, are investigated.

PB-167 008 Div. 25, 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.

BIHARMONIC SOLUTIONS TO THE STEADY-STATE THERMOELASTIC PROBLEMS IN THREE DIMENSIONS,
by Jerzy Nowinski. Dec 59, 28p
Technical summary rept. no. MRC-TSR-125
Contract DA11 022ORD2059
AD 231 354

Unclassified report

Descriptors: (*Heat transfer, Elasticity), (*Elasticity, Heat transfer), Potential theory, Three-dimensional flow, Spheres, Vector analysis.

The Kelvin-Almansi representation of biharmonic functions in terms of 2 harmonic functions is applied to 3-dimensional thermoelastic problems involving steady states of heat flow. The solutions to illustrative problems concerning the elastic half-space, an infinite thick plate, and a solid sphere are given for arbitrary fields of temperature. (Author)

PB-167 016 Div. 25, 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
CYLINDRICALLY ORTHOTROPIC CIRCULAR PLATES WITH LARGE DEFLECTIONS,
by Jerzy Nowinski. Jan 60, 17p
Technical summary rept. no. MRC-TSR-133
Contract DA11 022ORD2059
AD 233 613

Unclassified report

Descriptors: (*Sheets, Deflection), (*Boundary value problems, Sheets), Elasticity, Deformation, Perturbation theory, Numerical analysis.

Large deflections of anisotropic plates are considered using, simultaneously, 2 efficient and straightforward methods, the perturbation method of Poincare and a modification of the Galerkin method based on the energy concept. (Author)

PB-167 019 Div. 25
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
CONVERGENCE OF CHANDRASEKHAR'S METHOD FOR THE PROBLEM OF DIFFUSE REFLECTION,
by Philip M. Anselone. Jan 60, 12p
Technical summary rept. no. MRC-TSR-136
Contract DA11 022ORD2059
AD 232 861

Unclassified report

Descriptors: (*Electromagnetic wave reflections, Atmosphere), Diffusion, Transport properties, Numerical analysis, Series, Integral equations.

PB-167 041 Div. 25, 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
SOME MIXED BOUNDARY-VALUE PROBLEMS FOR PLATES WITH LARGE DEFLECTIONS,
by J. Nowinski. Oct 58, 18p
Technical summary rept. no. MRC-TSR-42
Contract DA11 022ORD2059
AD 207 320

Unclassified report

Descriptors: (*Boundary value problems, Sheets), (*Sheets, Deflection), Elasticity, Deformation, Integral equations, Numerical analysis.

A general method of solving discontinuous boundary-value problems concerning elastic rectangular plates with large deflections is presented. It is based on the Berger approximate field equations for large deformation of plates, which replace the v. Karman equations, and reduces the problem to the solution of integral equations, involving some redundant quantities, at the intervals of discontinuity of the support. Investigation of a freely supported infinite plate strip with two symmetrical segments, at the edges, built-in, and acted on by a uniform load, is presented in more detail. A numerical example is given. (Author)

PB-167 048 Div. 25, 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
STABILITY OF PERTURBED PERIODIC MOTIONS,
by John A. Nohel. Mar 59, 32p
Technical summary rept. no. MRC-TSR-84
Contract DA11 022ORD2059
AD 215 250

Unclassified report

Descriptors: (*Motion, Stability), (*Differential equations, Stability), Matrix algebra, Perturbation theory, Differential geometry.

Sufficient conditions are extended for asymptotic stability in the sense of Liapounov in the case of periodic solutions of the quasilinear system $x' = Ax + muf(t,x,mu)$ and for symptotic orbital stability for periodic solutions of the autonomous system $x' = Ax + muf(x,mu)$, where A is a real constant n x n matrix having at least one characteristic root, x and f are real vectors with n components x sub i, f sub i (i=1,...,n), and t and mu are real. Stability criteria are derived for the case where A has exactly one pair of characteristic roots i and -i, while the remaining eigenvalues of A have negative real parts. A generalization is considered for the case where A may also have characteristic roots of the form iN, where N is an integer which may be zero. The quasi-linear system is then considered where the constant matrix A is replaced by a real continuous periodic matrix A(t) having period pi. The associated unperturbed system is assumed to have a periodic solution with period 2 pi. (DDC Abstract)

PB-167 053 Div. 25, 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
THE CLOCK PARADOX IN SPECIAL RELATIVITY,
by C. C. MacDuffee. Jun 59, 13p
Technical summary rept. no. MRC-TSR-92
Contract DA11 022ORD2059
AD 220 560

Unclassified report

Descriptors: (*Relativity theory, Time), (*Time-lag theory, Relativity theory), Mathematical analysis, Geodesics, Clocks, Calculus of variations.

The clock paradox in special relativity is considered in both four- and two-dimensional Minkowski space.

PB-167 056 Div. 25, 15
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.

A METHOD OF SOLUTION FOR THE ELASTIC QUARTER-PLANE,
by M. Hetenyi. Jun 59, 36p
Technical summary rept. no. MRC-TSR-95
Contract DA11 022ORD2059
AD 220 552

Unclassified report

Descriptors: (*Sheets, Elasticity), (*Elasticity, Mathematical analysis), (*Stresses, Sheets), Loading (Mechanics), Boundary value problems.

A method of solution is presented for the infinite elastic quarter-plane for the following cases: a concentrated force normal to the boundary; a concentrated force tangential to the boundary; partially distributed uniform loading.

PB-167 057 Div. 25, 15
CFSTI Prices: HC$1.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
A BETTI-RAYLEIGH THEOREM FOR ELASTIC BODIES EXHIBITING TEMPERATURE DEPENDENT PROPERTIES,
by Jerzy Nowinski. Jun 59, 11p
Technical summary rept. no. MRC-TSR-96
Contract DA11 022ORD2059
AD 220 553

Unclassified report

Descriptors: (*Elasticity, Temperature), (*Theorems, Elasticity), Deformation, Boundary value problems, Rods, Deflection, Stresses.

PB-167 079 Div. 25
CFSTI Prices: HC$2.00 MF$0.50

Mathematics Research Center, Univ. of Wisconsin, Madison.
TRANSIENT THERMOELASTIC PROBLEM FOR AN INFINITE MEDIUM WITH A SPHERICAL CAVITY EXHIBITING TEMPERATURE DEPENDENT PROPERTIES,
by Jerzy Nowinski. Feb 61, 32p
Technical summary rept. no. MRC-TSR-215
Contract DA11 022ORD2059
AD 253 142

Unclassified report

Descriptors: (*Elasticity, Temperature), (*Thermal stresses, Elasticity), Perturbation theory, Boundary value problems, Thermal expansion, Mechanical properties.

A polarly symmetric transient thermoelastic problem is considered for an infinite medium with a spherical cavity, the boundary of the cavity being subjected to a sudden temperature rise. Thermal and elastic properties of the medium are assumed to be temperature dependent. Using the perturbation method general equations for the displacements and stresses corresponding to particular boundary value problems have been found. An illustrative example, involving linear variation of conductivity and thermal expansion as well as quadratic variation of shear modulus with temperature, is discussed in detail. (Author)

PB-167 095 Div. 25, 15
CFSTI Prices: HC$3.00 MF$0.75

Mathematics Research Center, Univ. of Wisconsin, Madison.
ANTIPLANE ELASTIC SYSTEMS, IV. THE TORSION OF ISOTROPIC BEAMS,
by L. M. Milne-Thomson. Sep 60, 86p
Technical summary rept. no. MRC-TSR-197
Contract DA11 022ORD2059
AD 251 405

Unclassified report

Descriptors: (*Beams (Structural), Torque), (*Elasticity, Beams (Structural)), Stresses, Deformation, Numerical analysis, Conformal mapping.

In this report the torsion problem for isotropic cylindrical or prismatic beams is considered. Methods of approaching the problem are examined and the general solution is obtained whenever the cross-section is simply connected and can be mapped on a circle. Applications of the principles of virtual displacements and virtual stresses to give approximate solutions are illustrated. (Author)

26. Production and Management

Patent 3,172,513 Div. 26

POWER-OFF BRAKE WITH CLUTCHED RESET MECHANISM.
Patent assigned to Navy,
by Milton C. Neuman and Kenneth A. Risch.
9 Mar 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Hydraulic brakes, Machines), Positioning devices (Machinery), Clutches, Disks, Drive shafts, Torque, Patents.

The wet disk type fluid-actuated combination brake and manual drive is for use with motor driven machines. The brake is provided with a positively lockable manual positioner for torqueing the load shaft when the brake is on. The brake is released only upon the application of fluid pressure and is fluid immersed for unvarying braking torque characteristics.

Patent 3,174,318 Div. 26

METHOD OF FORMING ARTICLES FROM DUCTILE MATERIALS.
Patent assigned to Navy,
by Daniel M. Fox. 23 Mar 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Material forming, Ductility), (*Cold working, Metals), Patents, Copper, Dies, Structural shells, Anodes (Electron tubes), Magnetrons, Metal plates, Materials, Deformation.

Magnetron anode blocks are formed from copper or other ductile metal slugs. The blocks have improved dissipation of heat. The slug is formed of a stack of copper plates. A forging or forming tool is used to form the block utilizing the principle of plastic flow displacement of the copper metal at approximately room temperature.

Patent 3,175,469 Div. 26

HYDRAULIC CAM MOTOR VANE SWITCHING SYSTEM.

Patent assigned to Navy,
by William R. Kee. 30 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Hydraulic systems, Rotor blades (Turbomachinery)), (*Rotor blades (Turbomachinery), Rotation), Cams, Fluids, Pressure, Power conversion, Patents.

The vanes of a vane-type hydraulic power converter are maintained in contact with the converter rotor by applying a part of the converter operating pressurized fluid to the top surface of the vane. An arrangement is shown for switching the application of pressurized fluid when the operating pressure of the fluid in the converter is reversed in order to reverse the direction of operation of the power converter.

PB-167 108 Div. 26, 17, 20
CFSTI Prices: HC$3.00 MF$0.75

Commissariat a l'Energie Atomique, Paris (France).
THE PRODUCTION CONTROL LABORATORIES OF THE PLUTONIUM EXTRACTION PLANT AT MARCOULE (Les Laboratoires de Fabrication de L'usine D'Extraction du Plutonium de Marcoule),
by Andre Fontaine. Oct 64, 65p CEA-R-2700

Unclassified report

Report in French.

Descriptors: (*Plutonium, Production control), (*Laboratories, Production control), Separation, Metallurgical laboratories, Operation, France.

The paper presents the conditions prevailing, after six years of operation, in the Laboratories of the Plutonium Extraction Plant. The origins and objectives are briefly reviewed, the technology and staff recruitment policy are examined, and progress made is shown. The methods used as well as the scope of application and limits imposed at the present state are considered. Past achievements and further possibilities in the next future are examined. An attempt has been made to bring out the outlooks for the more distant future and to investigate the conditions required for the successfull carrying out of the program. (Author)

PB-167 199 Div. 26, 14, 25
CFSTI Prices: HC$1.00 MF$0.50

Michigan Univ., Ann Arbor. Coll. of Engineering.
SINTERING OF ZINC OXIDE.
Technical note,
by L. F. Norris and G. Parravano. Mar 62, 17p
Rept. no. 02832-14-T
Contract AF49 638 493, Projs. 9762, 02832, Task 37621
AFOSR 1961; AD 438 298

Unclassified report

Descriptors: (*Sintering, Zinc compounds), (*Zinc compounds, Oxides), (*Ceramic materials, Sintering), Spheres, Single crystals, Crystal growth, Transport properties, High-temperature research, Heat of activation, Diffusion.

Sintering studies have been conducted with single-crystal spheres of zinc oxide in air and at lower oxygen partial pressures and total pressures of .003 to 1.0 atmospheres over a temperature range of 1050-1250 C. Quantitative observations on the rate of growth of a neck between the spheres were made. No change in the distance between the geometrical centers of the spheres was observed. An analysis of the kinetic data shows that sintering was predominantly achieved by distillation through the surrounding gas phase. At higher total pressures there was evidence that diffusion through a hydrodynamic boundary layer above the solid surface was the rate-controlling step, while at lower pressures sintering was determined by the rate of evaporation. Previous studies of the welding together of zinc oxide microspheres in the temperature range 700-900 C have emphasized the operation of a bulk diffusional transport process, dependent on the nonstoichiometry of zinc oxide. Additional evidence to support this conclusion was obtained in the present work. The pattern of the prevailing transport mechanisms in zinc oxide from 700 to 1250 C is analyzed, and its application to other solid-state transfer processes is discussed. (Author)

27. Propulsion Systems

Patent 3,167,082 Div. 27

PRESSURE REGULATING VALVE.
Patent assigned to Air Force,
by William J. Oliphant. 26 Jan 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Valves, Pressure regulators), (*Jet engine valves, Engine fuel systems components), Patents, Pressure, Fuel meters, Turbojet engines, Orifices, Fluid flow.

The pressure regulating valve is interposed in the fuel supply system for an aircraft turbo jet engine for regulating the fuel to the engine. The arrangement of elements in the pressure regulating valve is such that the pressure drop across a metering orifice is maintained by controlling the pressure of the fuel on the upstream side of the metering orifice.

Patent 3,171,251 Div. 27

ROTATIONAL POWER PLANT.
Patent assigned to Army,
by Fritz K. Pauli. 2 Mar 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Rocket motors (Liquid Propellant), Turbopumps), (*Turbojet engines, Rocket motors (Liquid Propellants)), Rocket propulsion, JATOS, Patents.

The rotational power plant is utilized in a liquid propellant rocket and as a take-off for jet aircraft. The power plant combines a turbopump and combustion chamber into one unit. Liquid propellant is drawn through the hollow center of a cylindrical rotor which pressurizes the propellant and ejects it through holes in the rotor wall. After being forced through the injection holes in the rotor wall, the liquid propellant reacts with a circumferentially rotating catalyst which decomposes the liquid into steam. The steam drives a turbine wheel which is attached to the rotor and then exhausts through the nozzle to produce the thrust for the power plant unit.

Patent 3,173,246 Div. 27

COLLOID PROPULSION METHOD AND APPARATUS.
Patent assigned to NASA,
by Carl T. Norgren. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Colloids, Space propulsion), (*Space propulsion, Electrostatic generators), (*Electrostatic generators, Space propulsion), Electrostatic accelerators, Supersonic nozzles, Convergent-divergent nozzles, Vaporization, Patents.

The electrostatic engine is for propelling space vehicles. Colloidal particles are charged at the nozzle exhause by a corona discharge. The particles may be accelerated by an electrostatic accelerator. Submicron sized particles are utilized.

Patent 3,173,251 Div. 27

APPARATUS FOR IGNITING SOLID PROPELLANTS.
Patent assigned to NASA,
by Harrison Allen, Jr., Carl C. Ciepluch, and Edward Abraham Fletcher. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Rocket igniters, Solid rocket propellants), (*Solid rocket propellants, Rocket igniters), Ignition, Hypergolic rocket propellants, Patents.

Apparatus is provided for igniting a tubular mass of solid propellant. A measured quantity of hypergolic fluid is injected into an opening in the tubular mass. This fluid is directed against predetermined portions of the walls of the opening. An injector is mounted at one end of the propellant charge.

Patent 3,173,253 Div. 27

FLEXIBLE FORWARD GRAIN SUPPORT.
Patent assigned to Navy,
by Jack Elias. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Rocket motors (Solid propellant), Propellant control), (*Solid rocket propellants, Propellant control), Propellant grains, Vibration isolators, Supports, Patents.

The flexible propellant support is for a free standing propellant grain used in a rocket engine. The support deflects upon initial impact load so that grain stresses are relieved at the time of highest dynamic stress. A combination of springs and Belleville washers is used.

28. Psychology and Human Engineering

No entries

29. Quartermaster Equipment and Supplies

No entries

30. Research and Research Equipment

Patent 3,170,246 Div. 30, 4, 16

SPACE FILLING ATOMIC UNITS AND CONNECTORS FOR MOLECULAR MODELS.
Patent assigned to HEW,
by Walter L. Koltun. 25 Feb 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Molecules, Models (Simulations)), (*Training devices, Molecules), Atoms, Fastenings, Patents.

The three dimensional molecular model facilitates the study and visualization of chemical compounds in research and training in the biochemical and biophysical sciences. Elements representing atoms and male and female connectors are provided in which the bond angle may be varied.

Patent 3,172,039 Div. 30

OSCILLOSCOPE TESTING APPARATUS INCLUDING A REFERENCE WAVEFORM DISPLAY DEVICE.
Patent assigned to Army,
by Marvin H. Bernstein. 2 Mar 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Test equipment, Oscilloscopes), (*Oscilloscopes, Test equipment), Display systems, Electronic equipment, Electromagnetic pulses, Wave analyzers, Patents.

A display unit is provided including a plurality of pre-recorded pictorial representations of reference waveforms corresponding to the waveforms which should be observed at various test points. The display unit is designed to display selectively a desired reference waveform to the substantial exclusion of the others. An arrangement is provided for selectively switching the input of the oscilloscope to a desired test-point and simultaneously displaying the particular reference waveforms corresponding to that test-point. As the oscilloscope is switched to different test-points, the display unit is simultaneously actuated to display selectively the proper reference waveforms.

Patent 3,172,063 Div. 30

VARIABLE RELUCTANCE PICK-UP.
Patent assigned to Air Force,
by Ture Lindstrom and Robert E. Span. 2 Mar 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Measuring devices (Electrical and Electronic), Magnetic cores), Motion, Measurement, Monitors, Accelerometers, Gyroscopes, Electromechanical converters, Patents.

The pick-up is utilized with accelerometers, rate gyroscopes, and electromechanical gauging devices. The pick-up includes an annular magnetic core having a plurality of cores and an armature of permeable material. The arrangement of components is such that a small degree of mechanical motion is transformed into a distinguishable electrical signal.

Patent 3,172,092 Div. 30

VARIABLE RELUCTANCE ANGLE TRANSDUCER.
Patent assigned to Air Force,
by Robert L. Ledford and David S. Bynum. 2 Mar 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Electromagnetic properties, Measurement), (*Shafts, Monitors), Transducers, Electric bridges, Rotation, Magnetic cores, Magnetic materials, Patents.

The transducer remotely indicates the angular position of a housing rotatably mounted on a fixed shaft. Two magnetic cores are used, each having a winding attached with 180 degrees spacing to the shaft and situated inside a cylindrical housing of magnetic material carried by the rotating body and eccentric with respect to the shaft. The air gaps between the cores and the housing vary differentially as the body rotates and consequently a similar variation occurs in the winding reactances. For rotation in a single direction, the angular position of the body may be determined by making a historical record of the output of a Wheatstone bridge having the windings as two of the legs.

Patent 3,172,097 Div. 30

BINARY TO BINARY-CODED-DECIMAL CONVERTER.
Patent assigned to NASA,
by Edward H. Imlay. 2 Mar 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Binary arithmetic, Coding), (*Coding, Binary arithmetic), Computers, Circuits, Digital systems, Patents.

The apparatus is for converting a binary number to a binary-coded-decimal number. The apparatus includes a shift register having twelve stages, a complement-shift register which may include four stages and sense and complement circuits.

Patent 3,172,098 Div. 30

ANALOG TO DIGITAL CONVERTER.
Patent assigned to Army,
by Otmar E. Ringelhaan. 2 Mar 65 Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Analog-to-digital converters, Coding), Pulse modulation, Feedback, Gates (Circuits), Patents.

The converter is for translating a pulse duration modulation input into a multi-unit code. It includes a shift register having a plurality of binary stages, an OR gate, a source of duration modulated pulses, feedback components and gating elements for passing a predetermined number of pulses appearing at the output of the last of the stages to an external circuit. The gate is opened a predetermined time after the occurrence of the leading edge of the duration modulated pulses.

Patent 3,173,880 Div. 30

MOISTURE INDICATOR AND METHOD OF MAKING THE SAME.
Patent assigned to AEC,
by William S. Pappas and Charles W. Weber. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Hygrometers, Silicon compounds), (*Halogenated hydrocarbons, Moisture), (*Silicon compounds, Gels), (*Gels, Silicon compounds), Dioxides, Cobalt compounds, Bromides, Inorganic acids, Water, Coolants, Patents.

The indicator determines the amount of water in liquids of low water solubility, including halogenated hydrocarbons such as Freon 114. The indicating material consists of activated silica gel impregnated with about 2 to 3 weight percent cobaltous bromide and at least 0.5 weight percent of hydrobromic acid.

Patent 3,173,983 Div. 30

ARC POSITIONING SERVO.
Patent assigned to AEC,
by James L. Engle. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Servomechanisms, Positioning devices (Machinery)), Light pulses, Optical equipment, Electromagnets, Phototubes, Illumination, Intensity, Scattering, Patents.

The servo mechanism is utilized for positioning a source of light, particularly an arc lamp, in preferential or optimal alignment with an optical device such as a monochromotor. Variation in the intensity of illumination is prevented by automatically orienting the source of light to maintain it in alignment with a slit. The source of light may be repositioned until the output of a phototube equals a reference voltage.

Patent 3,174,139 Div. 30

ELECTRONIC PROGRESSION INDICATOR.
Patent assigned to Air Force,
by Nicholas Vecchiarelli and Francis E. Heise.
16 Mar 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Computer logic, Display systems), (*Data processing systems, Display systems), Magnetic cores, Thyratrons, Electric currents, Motion, Monitors, Patents.

The indicator may be utilized to indicate the progress of a data-representing electric current along the interlinked coils of a magnetic core type of shift register. The arrangement includes a serially connected group of magnetic cores constituting a shift register, and a series of thyratron tubes. The tube circuits include resistors and capacitors.

31. Ships and Marine Equipment

No entries

32. Miscellaneous Arts and Sciences

Patent 3,173,792 Div. 32, 4

METHOD OF OBTAINING DETOXIFIED MEAL FROM SEEDS CONTAINING BOTH ISOTHIOCYANATE AND THIOOXAZOLIDONE.
Patent assigned to Agriculture,
by Gus C. Mustakas and Larry D. Kirk. 16 Mar 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Seeds, Processing), (*Antimetabolites, Separation), (*Thiocyanates, Separation), (*Glycosides, Separation), Food, Purification, Hydrolysis, O-Heterocyclic compounds, N-Heterocyclic compounds, Bovines, Mustard agents, Organic sulfur compounds, Ketones, Patents.

The thiooxazolidone-containing seeds of Crambe abyssinica and rapeseed are treated to hydrolyze and/or remove not only the volatile isothiocyanate constituents but also the nonvolatile thiooxazolidone constituent and thus provide a nutritious feed for animals, especially livestock.

Patent 3,171,733 Div. 32, 4

HIGH-ANALYSIS AMMONIUM POLYPHOSPHATE FERTILIZER.
Patent assigned to TVA,
by Travis P. Hignett and John G. Getsinger. 2 Mar 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Fertilizers, Preparation), (*Ammonium compounds, Phosphates), Phosphoric acids, Ammonia, Industrial equipment, Patents.

The composition contains a total plant food content in the range from about 73 to 82 percent by weight. It consists of at least 50 percent monoammonium orthophosphate, about 38 percent tetraamonium pyrophosphate and about 2 percent higher ammonium pyrophosphates.

33. Transportation

PB-167 183 Div. 33
CFSTI Prices: HC$3.00 MF$0.75

Bureau of Reclamation, Denver, Colo.
RESULTS OF STUDIES ON DESIGN OF STABLE CHANNELS.
Progress rept.,
comp. by E. W. Lane. Jun 52, 61p
Hydraulic Lab. rept. no. Hyd-352
Unclassified report

Descriptors: (*Inland waterways, Design), Silt, Sedimentation, Water, India, Pakistan, Colorado, United States.

New and improved methods in the design of unlined canals were investigated. Particular emphasis was given to methods of obtaining a rational solution to the problem of sediment transportation as it relates to design of unlined canals. The principal progress was along three general lines: (1) the clarification of the general principles of stable channel design, (2) the working out of a tentative method of designing unlined earth canals to insure freedom from scour, and (3) the development of an analysis of the channel shape for certain conditions involving minimum excavation quantities. The first part of the paper considers general aspects of the problem, fundamental principles involved, conditions encountered, and type of solution required for each. Part two covers the principles involved in protection of canals against scour from flowing water. The third part deals with development of an analysis of the channel shapes for canals involving minimum excavation quantities.

PB-167 186 Div. 33
CFSTI Prices: HC$1.00 MF$0.75

Department of Commerce, Washington, D. C. Panel on Transportation Research and Development.
REPORT OF THE PANEL ON TRANSPORTATION RESEARCH AND DEVELOPMENT OF THE COMMERCE TECHNICAL ADVISORY BOARD TO THE SECRETARY OF COMMERCE,
6 May 65, 95p
Unclassified report

Descriptors: (*Transportation, Research program administration), United States Government, Commerce, Industrial research, Traffic, Roads, Railroads, Safety, Economics, Sociology, Urban areas, Reports.

The report incorporates the panel members' experience in transportation, their recent joint study of this topic, and their discussions and exchange of views during the panel's meetings. It presents the panel's comprehensive view of transportation R and D needs in this country and describes particularly representative problems. The Panel's recommendations focus on the sort of environment which the Secretary of Commerce must foster to fulfill the Department's role as the President's principle advisor on transportation R and D. Specific programs are recommended to create this environment, and a framework is suggested for developing more detailed plans and projects in the future.

SUBJECT INDEX

DESCRIPTOR	DIV	ACCESS. NO.
ACOUSTIC EQUIPMENT	02S	PB-167 129
ACRYLIC RESINS	14S	PAT-3172856
ADHESIVES	04S	PAT-3171750
AEROSPACE CRAFT	12S	AD-447 995
ALDEHYDES	04S	PAT-3173761
ALGEBRA	15S	PB-167 029
	15S	PB-167 103
ALGEBRAIC TOPOLOGY	15S	PB-167 030
ALUMINUM ALLOYS	14S	PAT-3175931
AMINES	14S	PAT-3173871
AMMONIUM COMPOUNDS	32S	PAT-3171733
ANALOG-TO-DIGITAL CONVERTERS	30S	PAT-3172098
ANALYSIS OF VARIANCE	15S	PB-167 092
ANTENNAS	08S	PAT-3175156
ANTIMETABOLITES	32S	PAT-3173792
ANTIOXIDANTS	14S	PAT-3173871
BARIUM COMPOUNDS	14S	PAT-3172855
BEAMS (STRUCTURAL)	25S	PB-167 005
	25S	PB-167 095
BESSEL FUNCTIONS	15S	PB-167 040
BINARY ARITHMETIC	30S	PAT-3172097
BINOMIALS	15S	PB-167 083
BONDED JOINTS	04S	PAT-3171750
BOUNDARY VALUE PROBLEMS	25S	PB-167 016
	25S	PB-167 041
	15S	PB-167 071
	15S	PB-167 084
BOUNDARY VALVE PROBLEMS	15S	PB-167 022
BUOYS	22S	PAT-3175525
	02S	PB-167 135
	02S	PB-167 137
	02S	PB-167 148
	02S	PB-167 155
	02S	PB-167 160
CABLES (MECHANICAL)	02S	PB-167 163
CALCIUM COMPOUNDS	14S	PAT-3172855
	04S	PAT-3173755
CALCULUS OF VARIATIONS	15S	PB-167 102
CARBIDES	14S	PAT-3174827
CERAMIC MATERIALS	04S	PAT-3171750
	26S	PB-167 199
CIRCUITS	07S	PAT-3174051
COATINGS	14S	PAT-3175931
COAXIAL CABLES	05S	PAT-3174118
CODING	30S	PAT-3172097
COLD WORKING	26S	PAT-3174318
COLLOIDS	27S	PAT-3173246
COMBINATORIAL ANALYSIS	15S	PB-167 001
	15S	PB-167 015
	15S	PB-167 025
	15S	PB-167 026
	15S	PB-167 028
	15S	PB-167 078
	15S	PB-167 088
	15S	PB-167 091
COMPOSITE MATERIALS	02S	PB-167 160
COMPUTER LOGIC	30S	PAT-3174139
COMPUTER STORAGE DEVICES	08S	PAT-3176154
CONTAINERS	14S	PAT-3175931
CONTROL SYSTEMS	02S	PB-167 164
CORROSION	02S	PB-167 126
CORROSION INHIBITION	02S	PB-167 125
	02S	PB-167 133
COUPLINGS	13S	PAT-3174781
	02S	PB-167 132
CRYSTAL COUNTERS	20S	PB-167 109
CURVE FITTING	15S	PB-167 027
	15S	PB-167 086
DATA PROCESSING SYSTEMS	30S	PAT-3174139
DELAY CIRCUITS	08S	PAT-3172043
DELAY LINES	08S	PAT-3175195
DEPTH FINDING	02S	PAT-3174128
DIFFERENCE EQUATIONS	15S	PB-167 081
DIFFERENTIAL EQUATIONS	15S	PB-167 010
	15S	PB-167 018
	15S	PB-167 022
	15S	PB-167 038
	15S	PB-167 043
	25S	PB-167 048
	15S	PB-167 059
	15S	PB-167 060
	15S	PB-167 062
	15S	PB-167 063
	15S	PB-167 070
	15S	PB-167 072
	15S	PB-167 094
	15S	PB-167 102
	15S	PB-167 105
	15S	PB-167 106
	02S	PB-167 120
	02S	PB-167 122
	02S	PB-167 123
DIFFERENTIAL GEOMETRY	15S	PB-167 043
DIODES (SEMICONDUCTOR)	20S	PB-167 109
DIPOLE ANTENNAS	08S	PAT-3172111
DISCONNECT FITTINGS	02S	PB-167 150
DISTRIBUTION THEORY	15S	PB-167 087
DOSIMETERS	20S	PB-167 114
DRILLING MACHINERY	02S	PB-167 119
	02S	PB-167 156
	02S	PB-167 161
DRILLING MACHINES	02S	PB-167 157
	02S	PB-167 165
DRILLS	02S	PB-167 159
ELASTICITY	25S	PB-167 005
	25S	PB-167 008
	25S	PB-167 008
	25S	PB-167 056
	25S	PB-167 057
	25S	PB-167 079
	25S	PB-167 095
ELECTRIC CONNECTORS	07S	PAT-3171706
ELECTRIC FILTERS	15S	PB-167 009
ELECTROMAGNETIC PROPERTIES	30S	PAT-3172092
ELECTROMAGNETIC WAVE REFLECTIONS	25S	PB-167 019
ELECTROMECHANICAL CONVERTERS	25S	PAT-3174130
ELECTRONIC EQUIPMENT	02S	PB-167 129
ELECTRONIC SCANNERS	08S	PAT-3175156
ELECTROSTATIC GENERATORS	27S	PAT-3173246
EPOXY PLASTICS	14S	PB-167 198
EQUATIONS	15S	PB-167 073
EXPANDED PLASTICS	14S	PAT-3173887
	02S	PB-167 148
	02S	PB-167 160
FACTOR ANALYSIS	15S	PB-167 025
FERTILIZERS	32S	PAT-3171733
FILTERS (ELECTROMAGNETIC WAVE)	08S	PAT-3175158
FLOATING BODIES	02S	PB-167 118
	02S	PB-167 119
	02S	PB-167 121
	02S	PB-167 157
	02S	PB-167 165
FLOATS	02S	PB-167 158
FLOWMETERS	02S	PAT-3175459
FLUID FLOW	09S	PB-167 055
FLUIDS	12S	AD-447 995
FOAMS	02S	PB-167 148
	02S	PB-167 160
FRACTURE (MECHANICS)	02S	PB-167 162
FUEL CELLS	07S	PAT-3174833
FUNCTIONS	15S	PB-167 050
GAME THEORY	15S	PB-167 017
GAS GENERATING SYSTEMS	07S	PAT-3174833
	22S	PAT-3175525
	02S	PB-167 158
GELS	30S	PAT-3173880
GEOPHYSICAL PROSPECTING	02S	PB-167 138
GLASS	02S	PB-167 144
GLYCOSIDES	32S	PAT-3173792
GRAPHITE	20S	PAT-3173973
GREASES	14S	PAT-3173869
	14S	PAT-3174930
GROUPS (MATHEMATICS)	15S	PB-167 103
GUANIDINES	04S	PAT-3173755
HALOGENATED HYDROCARBONS	30S	PAT-3173880
HEAT TRANSFER	25S	PB-167 008
HOISTS	02S	PB-167 140
	02S	PB-167 149
HULLS (MARINE)	02S	PB-167 118
HYDRAULIC BRAKES	26S	PAT-3172513
HYDRAULIC SYSTEMS	26S	PAT-3175469
	12S	AD-447 995
HYDROPHONES	02S	PB-167 129
HYGROMETERS	30S	PAT-3173880
IDENTITIES	15S	PB-167 054
INEQUALITIES	15S	PB-167 030
	15S	PB-167 034
	15S	PB-167 050
	15S	PB-167 078
	15S	PB-167 082
	15S	PB-167 096
INLAND WATERWAYS	33S	PB-167 183
INTEGRAL EQUATIONS	15S	PB-167 085
	15S	PB-167 098
INTEGRALS	15S	PB-167 104
INTEGRATION	15S	PB-167 063
ION EXCHANGE	20S	PAT-3173757
ISOCYANATE PLASTICS	14S	PAT-3173887
ITERATIVE METHODS	15S	PB-167 046
	15S	PB-167 073
	15S	PB-167 085
JET ENGINE VALVES	27S	PAT-3167082
KETONES	04S	PAT-3173761
LABORATORIES	26S	PB-167 108
LATCHES	02S	PB-167 134
LUBRICANT ADDITIVES	14S	PAT-3172855
	14S	PAT-3172856
	14S	PAT-3173870
	14S	PAT-3173871
LUBRICANTS	14S	PAT-3173869
	14S	PAT-3174930
MAGNETIC AMPLIFIERS	08S	PAT-3171191
MAGNETIC MODULATORS	08S	PAT-3172061
MAGNETOSTRICTIVE ELEMENTS	25S	PAT-3174130
MARINE GEOLOGY	02S	PB-167 141
	02S	PB-167 146
	02S	PB-167 154
	02S	PB-167 299
MARINE GEOPHYSICS	02S	PB-167 145
MARINE PROPULSION	02S	PB-167 157
	02S	PB-167 164
MATERIAL FORMING	26S	PAT-3174318
MATHEMATICAL MODELS	02S	PB-167 164
MATRIX ALGEBRA	15S	PB-167 015
	15S	PB-167 022
	15S	PB-167 028
	15S	PB-167 036
	15S	PB-167 072
	15S	PB-167 074
MEASURING DEVICES (ELECTRICAL AND ELECTRONIC)	30S	PAT-3172063
MODULATORS	08S	PAT-3175155
MOLECULES	30S	PAT-3170246
MOTION	25S	PB-167 048
NAVIGATION SATELLITES	19S	PAT-3172108
NICKEL ALLOYS	17S	PAT-3174851
NITRIC ACID	20S	PAT-3174818
NOISE	02S	PB-167 136
NONLINEAR DIFFERENTIAL EQUATIONS	15S	PB-167 034
NUMBER THEORY	15S	PB-167 029
NUMBERS	15S	PB-167 078
NUMERICAL ANALYSIS	15S	PB-167 084
	15S	PB-167 086
	15S	PB-167 107
OCEAN CURRENTS	02S	PB-167 151
	02S	PB-167 153
OCEAN WAVES	02S	PB-167 152
OCEANOGRAPHIC EQUIPMENT	02S	PAT-3174128
OPERATORS (MATHEMATICS)	15S	PB-167 028
	15S	PB-167 028
ORGANIC SULFUR COMPOUNDS	14S	PAT-3173870
OSCILLOSCOPES	30S	PAT-3172039
PAINTS	02S	PB-167 126
PARACHUTES	12S	PAT-3173637
PARTIAL DIFFERENTIAL EQUATIONS	15S	PB-167 040
	15S	PB-167 046
	15S	PB-167 047
	15S	PB-167 071
	15S	PB-167 084
	15S	PB-167 086
PERTURBATION THEORY	15S	PB-167 058
	15S	PB-167 105
PHENOLS	14S	PAT-3173871
PHOTOGRAMMETRY	02S	PB-167 207
PIPES	02S	PB-167 124
	02S	PB-167 125
	02S	PB-167 127
	02S	PB-167 130
	02S	PB-167 132
	02S	PB-167 133
	02S	PB-167 139
	02S	PB-167 142
	02S	PB-167 143
	02S	PB-167 155
	02S	PB-167 161
PLASTIC COATINGS	14S	PB-167 198
PLUTONIUM	26S	PB-167 108
PLUTONIUM COMPOUNDS	20S	PAT-3171714
PRINTED CIRCUITS	14S	PB-167 198
PULSE COUNTERS	08S	PAT-3176161
PULSE GENERATORS	08S	PAT-3172042
RADAR ANTENNAS	08S	PAT-3172111
RADAR EQUIPMENT	08S	PAT-3174119
RADIATION MEASUREMENT SYSTEMS	20S	PB-167 110
RADIOACTIVE WASTE	20S	PAT-3173757
REACTOR FUEL ELEMENTS	20S	PAT-3171715
	20S	PAT-3171815
REACTOR FUEL PROCESSING	20S	PAT-3171714
	20S	PAT-3173973
RECTANGULAR BODIES	02S	PB-167 166
RELATIVITY THEORY	25S	PB-167 053
RELAXATION OSCILLATORS	08S	PAT-3175162
RESEARCH REACTORS	20S	PB-167 110
ROCKET IGNITERS	27S	PAT-3173251
ROCKET MOTORS (LIQUID PROPELLANT)	27S	PAT-3171251
ROCKET MOTORS (SOLID PROPELLANT)	27S	PAT-3173253
ROTATING-MIRROR CAMERAS	24S	PAT-3174153
ROTOR BLADES (TURBOMACHINERY)	26S	PAT-3175469
RUPTURE	02S	PB-167 142
SEALS (STOPPERS)	02S	PB-167 147
SEEDS	32S	PAT-3173792
SEISMOLOGY	02S	PB-167 141
	02S	PB-167 154
SEQUENCES	15S	PB-167 096

DESCRIPTOR	DIV	ACCESS. NO.
STEEL	02S	PB-167 124
	02S	PB-167 125
	02S	PB-167 162
STRESSES	25S	PB-167 056
STRONTIUM COMPOUNDS	20S	PAT-3173757
STYRENE PLASTICS	14S	PAT-3173870
SULFONATES	14S	PAT-3172855
SUPPRESSORS	08S	PAT-3174119
SURVEYING	02S	PB-167 207
SWITCHING CIRCUITS	08S	PAT-3176161
TELEMETER SYSTEMS	12S	PAT-3171894
TERRESTRIAL MAGNETISM	02S	PB-167 145
TEST EQUIPMENT	30S	PAT-3172039
THEOREMS	25S	PB-167 057
THERMAL STRESSES	25S	PB-167 079
THIOCYANATES	32S	PAT-3173792
THORIUM COMPOUNDS	20S	PAT-3171715
	20S	PAT-3171815
TIME-LAG THEORY	25S	PB-167 053
TITANIUM	02S	PB-167 163
TITANIUM ALLOYS	17S	PAT-3174851
	02S	PB-167 132
TORPEDOES	22S	PAT-3175525
TRACER STUDIES	02S	PB-167 131
TRAINING DEVICES	30S	PAT-3170246
TRANSDUCERS	25S	PAT-3174130
TRANSPORTATION	33S	PB-167 186
TROPICAL CYCLONES	02S	PB-167 128
TUNNEL DIODES	08S	PAT-3176154
TURBOJET ENGINES	27S	PAT-3171251
URANIUM COMPOUNDS	20S	PAT-3171715
	20S	PAT-3171815
VALVES	27S	PAT-3167082
WEATHER FORECASTING	02S	PB-167 128
WELL LOGGING	02S	PB-167 118
	02S	PB-167 119
	02S	PB-167 120
	02S	PB-167 121
	02S	PB-167 122
	02S	PB-167 123
	02S	PB-167 124
	02S	PB-167 125
	02S	PB-167 126
SERIES	15S	PB-167 052
	15S	PB-167 081
	15S	PB-167 098
	15S	PB-167 104
SERVOMECHANISMS	30S	PAT-3173983
SET THEORY	15S	PB-167 017
SHAFTS	30S	PAT-3172092
SHEETS	25S	PB-167 016
	25S	PB-167 041
	25S	PB-167 056
SHIP HULLS	02S	PB-167 166
SHIPS	19S	PB-166 902
	02S	PB-167 120
	02S	PB-167 121
	02S	PB-167 122
	02S	PB-167 123
	02S	PB-167 165
	02S	PB-167 166
SIGNAL GENERATORS	05S	PAT-3174118
SILICON	20S	PB-167 109
SILICON COMPOUNDS	30S	PAT-3173880
	14S	PAT-3174827
SINGLE SIDEBAND COMMUNICATION SYSTEMS	08S	PAT-3175155
SINTERING	26S	PB-167 199
SITE SELECTION	02S	PB-167 146
SLOT ANTENNAS	08S	PAT-3172112
	08S	PAT-3172113
SOLENOIDS	08S	PAT-3176195
SOLID ROCKET PROPELLANTS	27S	PAT-3173251
	27S	PAT-3173253
SONAR BEACONS	19S	PB-166 902
SPACE PROPULSION	27S	PAT-3173246
SPACE SURVEILLANCE SYSTEMS	12S	PAT-3171894
SPECIAL FUNCTIONS (MATHEMATICAL)	15S	PB-167 052
STAINLESS STEEL	20S	PAT-3174818
STATISTICAL ANALYSIS	15S	PB-167 009
STATISTICAL DATA	15S	PB-167 027
STATISTICAL DISTRIBUTIONS	15S	PB-167 042
	15S	PB-167 083
	15S	PB-167 087
STATISTICAL TESTS	20S	PB-167 110
	02S	PB-167 127
	02S	PB-167 128
	02S	PB-167 129
	02S	PB-167 130
	02S	PB-167 131
	02S	PB-167 132
	02S	PB-167 133
	02S	PB-167 134
	02S	PB-167 135
	02S	PB-167 136
	02S	PB-167 137
	02S	PB-167 138
	02S	PB-167 139
	02S	PB-167 140
	02S	PB-167 141
	02S	PB-167 142
	02S	PB-167 143
	02S	PB-167 144
	02S	PB-167 145
	02S	PB-167 146
	02S	PB-167 147
	02S	PB-167 148
	02S	PB-167 149
	02S	PB-167 150
	02S	PB-167 151
	02S	PB-167 152
	02S	PB-167 153
	02S	PB-167 154
	02S	PB-167 155
	02S	PB-167 156
	02S	PB-167 157
	02S	PB-167 158
	02S	PB-167 159
	02S	PB-167 160
	02S	PB-167 161
	02S	PB-167 162
	02S	PB-167 163
	02S	PB-167 164
	02S	PB-167 165
	02S	PB-167 166
	02S	PB-167 299
WOOD	14S	PAT-3173460
ZINC COMPOUNDS	26S	PB-167 199

PERSONAL AUTHOR INDEX

PERSONAL AUTHOR	DIV	ACCESS. NO.
ALLEN, H. JR.	27S	PAT-3173251
ALLEN, W. JR.	02S	PB-167 137
ALTMAN, D. E.	08S	PAT-3172043
ANDERSON, T.	24S	PAT-3174153
ANSELONE, P. M.	25S	PB-167 019
	15S	PB-167 042
	15S	PB-167 107
BAILEY, G. F.	02S	PAT-3175459
BAIN, J.	02S	PB-167 122
	02S	PB-167 123
BAIN, J. A.	02S	PB-167 118
BARRETT, J. H.	15S	PB-167 018
	15S	PB-167 022
BARTHOLOMEW, A. J.	02S	PB-167 160
BENNETT, O. G.	04S	PAT-3171750
BERNSTEIN, M. H.	30S	PAT-3172039
BLACKMER, R. H.	07S	PAT-3174833
BLAIS, M.	04S	PAT-3173755
BLUE, D. M.	02S	PB-167 141
	02S	PB-167 154
BOOM, R. W.	08S	PAT-3176195
BOX, G. E. P.	15S	PB-167 027
BOYD, W. K.	02S	PB-167 124
	02S	PB-167 126
BRAY, L. A.	20S	PAT-3173757
BREETZ, L. D.	08S	PAT-3172111
BRETSCHNEIDER, C. L.	02S	PB-167 128
BROCKWAY, M. C.	20S	PAT-3173973
BUECKNER, H. F.	15S	PB-167 085
BUEHLER, W. J.	17S	PAT-3174851
BURGESS, C. A.	14S	PAT-3175931
BYNUM, D. S.	30S	PAT-3172092
CIEPLUCH, C. C.	27S	PAT-3173251
CIOCCIO, A.	08S	PAT-3171191
COLLINS, J. L.	02S	PB-167 128
COROLLER, Y. L.	20S	PB-167 109
COMPUT, J. G. V. D.	15S	PB-167 052
	15S	PB-167 054
CROCKER, A. R.	02S	PB-167 120
DAMERELL, V. R.	14S	PAT-3174930
DANIELS, T. E.	07S	PAT-3171706
DAWIRS, W. R.	08S	PAT-3172042
DEAN, O. C.	20S	PAT-3171815
DORFF, M.	15S	PB-167 080
	15S	PB-167 092
DOW, W.	02S	PAT-3174128
DOWNEY, F. X.	12S	PAT-3171894
DRAPER, N. R.	15S	PB-167 091
EASTMAN, E. J.	13S	PAT-3174781
EDREI, A.	15S	PB-167 050
ELIAS, J.	27S	PAT-3173253
ELLIOTT, J. S.	14S	PAT-3173871
ELLIS, R.	04S	PAT-3173761
ELSEA, A. R.	02S	PB-167 125
ENDL, K.	15S	PB-167 096
ENGLE, J. L.	30S	PAT-3173983
ERDELYI, A.	15S	PB-167 098
	15S	PB-167 104
FARRELL, G. F.	08S	PAT-3174119
FERGUSON, D. E.	20S	PAT-3171815
FIELDS, E. K.	14S	PAT-3173870
FLESHER, G. T.	08S	PAT-3175158
FLETCHER, E. A.	27S	PAT-3173251
FLUMR, F. R.	08S	PAT-3175195
FONTAINE, A.	26S	PB-167 108
FOX, D. M.	26S	PAT-3174318
FRAZIER, H. M.	08S	PAT-3171191
FRIEDLING, G.	20S	PB-167 110
GADDIS, A. M.	04S	PAT-3173761
GANST, A. W.	02S	PB-167 133
GETSINGER, J. G.	32S	PAT-3171733
GILBERT, J. P.	20S	PB-167 110
GOLOMB, M.	15S	PB-167 034
	15S	PB-167 060
GOODYEAR, M. V.	14S	PB-167 198
GREENSPAN, D.	15S	PB-167 084
	15S	PB-167 086
GROENEVELD, T. P.	02S	PB-167 125
GROSS, R. J.	12S	PAT-3173637
GURLAND, J.	15S	PB-167 080
	15S	PB-167 083
	15S	PB-167 087
	15S	PB-167 092
HACKER, J. R.	07S	PAT-3171706
HANANI, H.	15S	PB-167 001
	15S	PB-167 017
	15S	PB-167 026
	15S	PB-167 029
HANN, R. A.	14S	PAT-3173460
HARKER, W. H.	02S	PB-167 120
HARRIS, W. A. JR.	15S	PB-167 081
HARTMAN, P.	15S	PB-167 070
HEINARD, W. G.	08S	PAT-3172113
HEISE, F. E.	30S	PAT-3174139
HETENYI, M.	25S	PB-167 056
HIGNETT, T. P.	32S	PAT-3171733
HOEPPNER, D. W.	02S	PB-167 125
HOLDER, F. P.	08S	PAT-3175155
HOWELL, G. W.	12S	AD-447 995
HSIUNG, C. C.	15S	PB-167 030
HYLER, W. S.	02S	PB-167 124
	02S	PB-167 125
IMLAY, E. H.	30S	PAT-3172097
JACKSON, L. R.	02S	PB-167 124
JEWELL, R. A.	14S	PAT-3174827
JONES, L. V.	20S	PAT-3171714
JONES, R. J.	08S	PAT-3174119
KATTI, S. K.	15S	PB-167 083
KAUFMAN, M. G.	12S	PAT-3171894
KEE, W. R.	26S	PAT-3175469
KELLY, J. L.	20S	PAT-3171815
KEMPERMAN, J. H. B.	15S	PB-167 088
KIRK, L. D.	32S	PAT-3173792
KJONAAS, M.	14S	PAT-3172856
KLEINSTEUBER, A. T.	20S	PAT-3171715
KNOX, W. A.	02S	PB-167 141
	02S	PB-167 154
KOLTUN, W. L.	30S	PAT-3170246
KOPPENHAFER, A. C.	02S	PB-167 125
LANE, E. W.	33S	PB-167 183
LANGER, R. E.	15S	PB-167 010
	15S	PB-167 038
LEDFORD, R. L.	30S	PAT-3172092
LEFORT, H. G.	04S	PAT-3171750
LEKKI, W. J.	02S	PB-167 144
LIEBERSTEIN, H. M.	15S	PB-167 046
	15S	PB-167 047
LINDSTROM, T.	30S	PAT-3172063
LITTMAN, W.	15S	PB-167 071
LORING, L. D. JR.	14S	PAT-3173869
LOSEY, G.	15S	PB-167 103
LOUD, W. S.	15S	PB-167 058
	15S	PB-167 062
	15S	PB-167 072
	15S	PB-167 102
	15S	PB-167 105
MAIER, R. J.	02S	PB-167 120
MAINS, R. M.	02S	PB-167 119
MALINOWSKI, A. B.	08S	PAT-3172061
MANN, H. B.	15S	PB-167 025
MCCLURE, F. T.	19S	PAT-3172108
MCLAUGHLIN, D. J.	08S	PAT-3175195
METTERT, P. M.	02S	PB-167 136
MICHELSEN, F. C.	02S	PB-167 166
MILNE-THOMSON, L. M.	25S	PB-167 005
	09S	PB-167 055
	25S	PB-167 095
MILOSAVLJEVITCH, M.	02S	PB-167 166
MOORE, P. J.	05S	PAT-3174118
MOORE, R. L.	20S	PAT-3173757
MULLIGAN, J. L.	02S	PB-167 120
MUSTAKAS, G. C.	32S	PAT-3173792
NEUMAN, M. C.	26S	PAT-3172513
NOHEL, J. A.	25S	PB-167 048
NORGREN, C. T.	27S	PAT-3173246
NORRIS, L. F.	26S	PB-167 199
NOWINSKI, J.	25S	PB-167 008
	25S	PB-167 016
	25S	PB-167 041
	25S	PB-167 057
	25S	PB-167 079
OBERHETTINGER, F.	15S	PB-167 040
OFTE, D.	20S	PAT-3171714
OLIPHANT, W. J.	27S	PAT-3167082
OSTROWSKI, A. M.	15S	PB-167 015
	15S	PB-167 028
	15S	PB-167 073
	15S	PB-167 074
	15S	PB-167 082
	15S	PB-167 015
OVIST, E. B.	14S	PAT-3172856
PAITSON, L.	02S	PB-167 141
	02S	PB-167 154
PAPPAS, W. S.	30S	PAT-3173880
PARRAVANO, G.	26S	PB-167 199
PASLAY, P. R.	02S	PB-167 166
PATTERSON, A. E.	02S	PB-167 158
PATTERSON, W. J.	02S	PB-167 120
PAULI, F. K.	27S	PAT-3171251
PEPPER, W. H.	08S	PAT-3172113
PICARD, J. P.	04S	PAT-3173755
PUTS, J. R.	20S	PB-167 114
PUTZRATH, F. L.	07S	PAT-3174051
RABE, N.	02S	PB-167 166
REICHBACH, M.	15S	PB-167 017
REID, R. O.	02S	PB-167 152
	02S	PB-167 153
RIACH, K. A.	26S	PAT-3172513
RICE, D. W.	14S	PB-167 198
RINGELHAAN, O. E.	30S	PAT-3172098
ROBERTS, F. P.	20S	PAT-3173757
ROBERTS, L. D.	08S	PAT-3176195
ROBINSON, E. A.	15S	PB-167 009
ROGERS, J. D.	14S	PAT-3172855
ROGERS, W. M.	02S	PB-167 130
ROMANO, F.	20S	PB-167 114
RUST, F. G.	20S	PAT-3174818
SALTER, F. D.	08S	PAT-3176154
SAUNDERS, S. C.	15S	PB-167 078
SAVIT, C. H.	02S	PB-167 141
	02S	PB-167 154
SCHAFFER, J. D.	14S	PAT-3175931
SCHNEIDER, H.	15S	PB-167 103
SCHNEIDER, H. J.	02S	PB-167 130
SCHUETZ, A. E.	02S	PB-167 124
SCHULTE, W. C.	02S	PB-167 161
SEELEY, E. W.	08S	PAT-3172112
SHAH, S. M.	15S	PB-167 050
SHUMWAY, R.	15S	PB-167 087
SLETTEN, C. J.	08S	PAT-3175156
SMITH, W.	02S	PAT-3175459
SPAN, R. E.	30S	PAT-3172063
SPRIGGS, R. M.	04S	PAT-3171750
STEENLAND, N. C.	02S	PB-167 145
STILLMAN, S. L. JR.	02S	PAT-3174128
STUEBE, C. W.	14S	PAT-3172855
STULEN, F. B.	02S	PB-167 161
SWANSON, L. W.	02S	PB-167 207
THIERFELDER, C. M.	14S	PAT-3173887
TUCKER, P. A.	20S	PAT-3171714
URABE, M.	15S	PB-167 063
VECCHIARELLI, N.	30S	PAT-3174139
VERTREES, W. C.	08S	PAT-3176161
VRIES, G. D.	22S	PAT-3175525
WAKELYN, N. T.	14S	PAT-3174827
WALKER, W. F.	02S	PB-167 131
WARDRIP, S. C.	08S	PAT-3175195
WASON, W.	15S	PB-167 059
	15S	PB-167 106
WATSON, W. B.	14S	PAT-3173869
WEBER, C. W.	30S	PAT-3173880
WEINBERGER, H. F.	15S	PB-167 036
WHEELWRIGHT, E. J.	20S	PAT-3173757
WILCOX, C.	15S	PB-167 070
WILEY, R. C.	17S	PAT-3174851
WILSON, J. C.	15S	PB-167 094
WINN, J. B.	08S	PAT-3175162
WITTENBERG, L. J.	20S	PAT-3171714
WOOD, F. M.	02S	PB-167 130
WOOLLETT, R. S.	25S	PAT-3174130
WYLER, O.	15S	PB-167 043
YEATES, T. E.	14S	PAT-3173887

CORPORATE SOURCE INDEX

CORPORATE SOURCE	DIV	ACCESS. NO.
AMF TUBOSCOPE, INC., HOUSTON, TEX.	02S	PB-167 130
BATTELLE MEMORIAL INST., COLUMBUS, OHIO.	02S	PB-167 124
	02S	PB-167 125
	02S	PB-167 126
	02S	PB-167 162
BROWN AND ROOT, INC., HOUSTON, TEX.	02S	PB-167 118
	02S	PB-167 119
	02S	PB-167 120
	02S	PB-167 122
	02S	PB-167 123
	02S	PB-167 124
	02S	PB-167 125
	02S	PB-167 127
	02S	PB-167 128
	02S	PB-167 129
	02S	PB-167 130
	02S	PB-167 131
	02S	PB-167 132
	02S	PB-167 133
	02S	PB-167 134
	02S	PB-167 135
	02S	PB-167 136
	02S	PB-167 137
	02S	PB-167 138
	02S	PB-167 139
	02S	PB-167 140
	02S	PB-167 141
	02S	PB-167 142
	02S	PB-167 143
	02S	PB-167 144
	02S	PB-167 145
	02S	PB-167 146
	02S	PB-167 147
	02S	PB-167 148
	02S	PB-167 149
	02S	PB-167 150
	02S	PB-167 151
	02S	PB-167 152
	02S	PB-167 153
	02S	PB-167 154
	02S	PB-167 156
	02S	PB-167 157
	02S	PB-167 158
	02S	PB-167 159
	02S	PB-167 160
	02S	PB-167 161
	02S	PB-167 162
	02S	PB-167 163
	02S	PB-167 164
	02S	PB-167 165
	02S	PB-167 166
BUREAU OF RECLAMATION, DENVER, COLO.	33S	PB-167 183
COAST AND GEODETIC SURVEY, WASHINGTON, D. C.	02S	PB-167 207
COMMISSARIAT A L'ENERGIE ATOMIQUE, PARIS (FRANCE).	26S	PB-167 108
	20S	PB-167 114
COMMISSARIAT ENERGIE ATOMIQUE, SACLAY (FRANCE). CENTRE D'ETUDES NUCLEAIRES.	20S	PB-167 109
	20S	PB-167 110
CORNING GLASS WORKS, N. Y.	02S	PB-167 144
CURTISS-WRIGHT CORP., CALDWELL, N. J.	02S	PB-167 161
DEPARTMENT OF COMMERCE, WASHINGTON, D. C.	33S	PB-167 186
GENERAL ELECTRIC CO. SCHENECTADY, N. Y. ADVANCED TECHNOLOGY LABS.	02S	PB-167 122
GENERAL ELECTRIC CO., SCHENECTADY, N. Y.	02S	PB-167 118
	02S	PB-167 119
	02S	PB-167 120
	02S	PB-167 121
	02S	PB-167 123
GENERAL MOTORS CORP., SANTA BARBARA, CALIF.	02S	PB-167 129
GENERAL MOTORS CORP., DAYTON, OHIO. INLAND MANUFACTURING DIV.	02S	PB-167 148
	02S	PB-167 160
GRAVITY METER EXPLORATION CO., HOUSTON, TEX.	02S	PB-167 145
HONEYWELL, WEST COVINA, CALIF. CALIFORNIA ORDNANCE CENTER.	02S	PB-167 164
	02S	PB-167 165
HOUGHTON LABS., INC., OLEAN, N. Y.	14S	PB-167 198
HUGHES TOOL CO., HOUSTON, TEX. OIL TOOL DIV.	02S	PB-167 132
MATHEMATICS RESEARCH CENTER, UNIV. OF WISCONSIN, MADISON.	15S	PB-167 001
	25S	PB-167 005
	25S	PB-167 008
	15S	PB-167 009
	15S	PB-167 010
	15S	PB-167 015
	25S	PB-167 016
	15S	PB-167 017
	15S	PB-167 018
	25S	PB-167 019
	15S	PB-167 022
	15S	PB-167 025
	15S	PB-167 026
	15S	PB-167 027
	15S	PB-167 028
	15S	PB-167 029
	15S	PB-167 030
	15S	PB-167 034
	15S	PB-167 036
	15S	PB-167 038
	15S	PB-167 040
	25S	PB-167 041
	15S	PB-167 042
	15S	PB-167 043
	15S	PB-167 046
	15S	PB-167 047
	25S	PB-167 048
	15S	PB-167 050
	15S	PB-167 052
	25S	PB-167 053
	15S	PB-167 054
	09S	PB-167 055
	25S	PB-167 056
	25S	PB-167 057
	15S	PB-167 058
	15S	PB-167 059
	15S	PB-167 060
	15S	PB-167 062
	15S	PB-167 063
	15S	PB-167 070
	15S	PB-167 071
	15S	PB-167 072
	15S	PB-167 073
	15S	PB-167 074
	15S	PB-167 078
	25S	PB-167 079
	15S	PB-167 080
	15S	PB-167 081
	15S	PB-167 082
	15S	PB-167 083
	15S	PB-167 084
	15S	PB-167 085
	15S	PB-167 086
	15S	PB-167 087
	15S	PB-167 088
	15S	PB-167 091
	15S	PB-167 092
	15S	PB-167 094
	25S	PB-167 095
	15S	PB-167 096
	15S	PB-167 098
	15S	PB-167 102
	15S	PB-167 103
	15S	PB-167 104
	15S	PB-167 105
	15S	PB-167 106
	15S	PB-167 107
MICHIGAN UNIV., ANN ARBOR. COLL. OF ENGINEERING.	02S	PB-167 166
	26S	PB-167 199
NATIONAL ENGINEERING SCIENCE CO., PASADENA, CALIF.	02S	PB-167 127
	02S	PB-167 128
	02S	PB-167 153
NATIONAL SCIENCE FOUNDATION, WASHINGTON, D. C.	02S	PB-167 299
NATIONAL SUPPLY CO., TORRANCE, CALIF.	02S	PB-167 149
PACIFIC DIV., BENDIX CORP., NORTH HOLLYWOOD, CALIF.	19S	PB-166 902
PAN AMERICAN PETROLEUM CORP., TULSA, OKLA.	02S	PB-167 133
REED ROLLER BIT CO., HOUSTON, TEX.	02S	PB-167 139
SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEX.	02S	PB-167 140
TRW SPACE TECHNOLOGY LABS., REDONDO BEACH, CALIF.	12S	AD-447 995
WESTERN GEAR CORP., LYNWOOD, CALIF. SYSTEMS MANAGEMENT DIV.	02S	PB-167 157
WESTERN GEOPHYSICAL CO. OF AMERICA, LOS ANGELES, CALIF.	02S	PB-167 141
	02S	PB-167 146
WESTINGHOUSE ELECTRIC CORP., SUNNYVALE, CALIF.	02S	PB-167 158

CONTRACT NUMBER INDEX

CONTRACT NUMBER	DIV ACCESS. NO.
CONTRACT AF04 611 8385	12S AD-447 995
CONTRACT AF18 603 41	15S PB-167 070
CONTRACT AF49 638 43	15S PB-167 080
	15S PB-167 087
CONTRACT AF49 638 493	26S PB-167 199
CONTRACT DA11 022ORD2057	15S PB-167 070
CONTRACT DA11 022ORD2059	15S PB-167 001
	25S PB-167 005
	25S PB-167 008
	15S PB-167 009
	15S PB-167 010
	15S PB-167 015
	25S PB-167 016
	15S PB-167 017
	15S PB-167 018
	25S PB-167 019
	15S PB-167 022
	15S PB-167 025
	15S PB-167 026
	15S PB-167 027
	15S PB-167 028
	15S PB-167 029
	15S PB-167 030
	15S PB-167 034
	15S PB-167 036
	15S PB-167 038
	15S PB-167 040
	25S PB-167 041
	15S PB-167 042
	15S PB-167 043
	15S PB-167 046
	15S PB-167 047
	25S PB-167 048
	15S PB-167 050
	15S PB-167 052
	25S PB-167 053
	15S PB-167 054
	09S PB-167 055
	25S PB-167 056
	25S PB-167 057
	15S PB-167 058
	15S PB-167 059
	15S PB-167 060
	15S PB-167 062
	15S PB-167 063
	15S PB-167 071
	15S PB-167 072
	15S PB-167 073
	15S PB-167 074
	15S PB-167 078
	25S PB-167 079
	15S PB-167 080
	15S PB-167 081
	15S PB-167 082
	15S PB-167 083
	15S PB-167 084
	15S PB-167 085
	15S PB-167 086
	15S PB-167 087
	15S PB-167 088
	15S PB-167 091
	15S PB-167 092
	15S PB-167 094
	25S PB-167 095
	15S PB-167 096
	15S PB-167 098
	15S PB-167 102
	15S PB-167 103
	15S PB-167 104
	15S PB-167 105
	15S PB-167 106
	15S PB-167 107
CONTRACT DA36 039SC64608	14S PB-167 198
CONTRACT NSF C260	02S PB-167 118
	02S PB-167 119
	02S PB-167 120
	02S PB-167 121
	02S PB-167 122
	02S PB-167 123
	02S PB-167 124
	02S PB-167 125
	02S PB-167 126
	02S PB-167 127
	02S PB-167 128
	02S PB-167 129
	02S PB-167 130
	02S PB-167 131
	02S PB-167 132
	02S PB-167 133
	02S PB-167 134
	02S PB-167 135
	02S PB-167 136
	02S PB-167 137
	02S PB-167 138
	02S PB-167 139
	02S PB-167 140
	02S PB-167 141
	02S PB-167 142
	02S PB-167 143
	02S PB-167 144
	02S PB-167 145
	02S PB-167 146
	02S PB-167 147
	02S PB-167 148
	02S PB-167 149
	02S PB-167 150
	02S PB-167 151
	02S PB-167 152
	02S PB-167 153
	02S PB-167 154
	02S PB-167 155
	02S PB-167 156
	02S PB-167 157
	02S PB-167 158
	02S PB-167 159
	02S PB-167 160
	02S PB-167 161
	02S PB-167 162
	02S PB-167 163
	02S PB-167 165
	02S PB-167 166

ACCESSION/REPORT NUMBER INDEX

ACCESSION/REPORT NO.	DIV ACCESS. NO.
AD-156 499	15S PB-167 034
AD-156 732	15S PB-167 036
AD-161 819	15S PB-167 040
AD-161 979	15S PB-167 038
AD-204 754	14S PB-167 198
AD-207 320	25S PB-167 041
AD-207 321	15S PB-167 042
AD-207 322	15S PB-167 043
AD-212 056	15S PB-167 059
AD-215 250	25S PB-167 048
AD-218 479	15S PB-167 046
AD-218 480	15S PB-167 047
AD-218 613	15S PB-167 050
AD-220 380	15S PB-167 052
AD-220 551	15S PB-167 054
AD-220 552	25S PB-167 056
AD-220 553	25S PB-167 057
AD-220 560	25S PB-167 053
AD-225 914	09S PB-167 055
AD-228 711	15S PB-167 107
AD-231 354	25S PB-167 008
AD-231 355	15S PB-167 009
AD-231 356	15S PB-167 010
AD-232 856	15S PB-167 060
AD-232 860	15S PB-167 015
AD-232 861	25S PB-167 019
AD-233 613	25S PB-167 016
AD-233 614	15S PB-167 018
AD-233 615	15S PB-167 029
AD-233 616	15S PB-167 030
AD-234 799	15S PB-167 026
AD-235 840	15S PB-167 017
AD-235 841	15S PB-167 074
AD-235 842	15S PB-167 073
AD-235 843	15S PB-167 072
AD-235 844	15S PB-167 071
AD-237 136	15S PB-167 028
AD-237 137	15S PB-167 070
AD-237 138	15S PB-167 058
AD-239 424	15S PB-167 022
AD-239 425	15S PB-167 027
AD-245 952	15S PB-167 025
AD-247 299	15S PB-167 063
AD-247 393	15S PB-167 001
AD-247 397	25S PB-167 005
AD-247 400	15S PB-167 062
AD-247 401	15S PB-167 106
AD-247 402	15S PB-167 104
AD-247 403	15S PB-167 103
AD-247 404	15S PB-167 102
AD-248 828	15S PB-167 088
AD-249 528	15S PB-167 094
AD-250 290	15S PB-167 105
AD-250 291	15S PB-167 086
AD-250 292	15S PB-167 084
AD-250 691	15S PB-167 096
AD-250 692	15S PB-167 092
AD-250 693	15S PB-167 091
AD-251 403	15S PB-167 098
AD-251 405	25S PB-167 095
AD-251 407	15S PB-167 082
AD-252 720	15S PB-167 081
AD-252 722	15S PB-167 085
AD-252 723	15S PB-167 083
AD-253 140	15S PB-167 087
AD-253 141	15S PB-167 080
AD-253 142	25S PB-167 079
AD-253 143	15S PB-167 078
AD-438 298	26S PB-167 199
AD-447 995	12S AD-447 995
AFOSR-1961	26S PB-167 199
C-2951	02S PB-167 161
CEA-R-2700	26S PB-167 108
CEA-R-2722	20S PB-167 109
CEA-R-2725	20S PB-167 110
CEA-R-2768	20S PB-167 114
HYD-352	33S PB-167 183
MRC-TSR-120	15S PB-167 060
MRC-TSR-125	25S PB-167 008
MRC-TSR-126	15S PB-167 009
MRC-TSR-127	15S PB-167 010
MRC-TSR-132	15S PB-167 015
MRC-TSR-133	25S PB-167 016
MRC-TSR-134	15S PB-167 017
MRC-TSR-135	15S PB-167 018
MRC-TSR-136	25S PB-167 019
MRC-TSR-137	15S PB-167 026
MRC-TSR-138	15S PB-167 028
MRC-TSR-139	15S PB-167 029
MRC-TSR-140	15S PB-167 030
MRC-TSR-145	15S PB-167 074
MRC-TSR-146	15S PB-167 073
MRC-TSR-147	15S PB-167 072
MRC-TSR-148	15S PB-167 071
MRC-TSR-149	15S PB-167 070
MRC-TSR-150	15S PB-167 022
MRC-TSR-151	15S PB-167 027
MRC-TSR-153	15S PB-167 058
MRC-TSR-16	15S PB-167 034
MRC-TSR-174	15S PB-167 001
MRC-TSR-178	25S PB-167 005
MRC-TSR-18	15S PB-167 036
MRC-TSR-181	15S PB-167 062
MRC-TSR-182	15S PB-167 025
MRC-TSR-183	15S PB-167 063
MRC-TSR-184	15S PB-167 106
MRC-TSR-187	15S PB-167 105
MRC-TSR-188	15S PB-167 104
MRC-TSR-189	15S PB-167 103
MRC-TSR-190	15S PB-167 102
MRC-TSR-194	15S PB-167 098
MRC-TSR-196	15S PB-167 096
MRC-TSR-197	25S PB-167 095
MRC-TSR-198	15S PB-167 094
MRC-TSR-200	15S PB-167 092
MRC-TSR-201	15S PB-167 091
MRC-TSR-204	15S PB-167 088
MRC-TSR-205	15S PB-167 087
MRC-TSR-206	15S PB-167 086
MRC-TSR-207	15S PB-167 085
MRC-TSR-209	15S PB-167 084
MRC-TSR-210	15S PB-167 082
MRC-TSR-212	15S PB-167 083
MRC-TSR-213	15S PB-167 081
MRC-TSR-214	15S PB-167 080
MRC-TSR-215	25S PB-167 079
MRC-TSR-216	15S PB-167 078
MRC-TSR-22	15S PB-167 038
MRC-TSR-26	15S PB-167 040
MRC-TSR-42	25S PB-167 041
MRC-TSR-44	15S PB-167 042
MRC-TSR-45	15S PB-167 043
MRC-TSR-71	15S PB-167 059
MRC-TSR-80	15S PB-167 046
MRC-TSR-81	15S PB-167 047
MRC-TSR-84	25S PB-167 048
MRC-TSR-88	15S PB-167 050
MRC-TSR-91	15S PB-167 052
MRC-TSR-92	25S PB-167 053
MRC-TSR-93	15S PB-167 054
MRC-TSR-94	09S PB-167 055
MRC-TSR-95	25S PB-167 056
MRC-TSR-96	25S PB-167 057
MRC-TSR-97	15S PB-167 107
N64-32170	12S AD-447 995
PATENT-3167082	27S PAT-3167082
PATENT-3170246	30S PAT-3170246
PATENT-3171191	08S PAT-3171191
PATENT-3171251	27S PAT-3171251
PATENT-3171706	07S PAT-3171706
PATENT-3171714	20S PAT-3171714
PATENT-3171715	20S PAT-3171715
PATENT-3171733	32S PAT-3171733
PATENT-3171750	04S PAT-3171750
PATENT-3171815	20S PAT-3171815
PATENT-3171894	12S PAT-3171894
PATENT-3172039	30S PAT-3172039
PATENT-3172042	08S PAT-3172042
PATENT-3172043	08S PAT-3172043
PATENT-3172061	08S PAT-3172061
PATENT-3172063	30S PAT-3172063
PATENT-3172092	30S PAT-3172092
PATENT-3172097	30S PAT-3172097
PATENT-3172098	30S PAT-3172098
PATENT-3172108	19S PAT-3172108
PATENT-3172111	08S PAT-3172111
PATENT-3172112	08S PAT-3172112
PATENT-3172113	08S PAT-3172113
PATENT-3172513	26S PAT-3172513
PATENT-3172855	14S PAT-3172855
PATENT-3172856	14S PAT-3172856
PATENT-3173246	27S PAT-3173246
PATENT-3173251	27S PAT-3173251
PATENT-3173253	27S PAT-3173253
PATENT-3173460	14S PAT-3173460
PATENT-3173637	12S PAT-3173637
PATENT-3173755	04S PAT-3173755
PATENT-3173757	20S PAT-3173757
PATENT-3173761	04S PAT-3173761
PATENT-3173792	32S PAT-3173792
PATENT-3173869	14S PAT-3173869
PATENT-3173870	14S PAT-3173870
PATENT-3173871	14S PAT-3173871
PATENT-3173880	30S PAT-3173880
PATENT-3173887	14S PAT-3173887
PATENT-3173973	20S PAT-3173973
PATENT-3173983	30S PAT-3173983
PATENT-3174051	07S PAT-3174051
PATENT-3174118	05S PAT-3174118
PATENT-3174119	08S PAT-3174119
PATENT-3174128	02S PAT-3174128
PATENT-3174130	25S PAT-3174130
PATENT-3174139	30S PAT-3174139
PATENT-3174153	24S PAT-3174153
PATENT-3174318	26S PAT-3174318
PATENT-3174781	13S PAT-3174781
PATENT-3174818	20S PAT-3174818
PATENT-3174827	14S PAT-3174827
PATENT-3174833	07S PAT-3174833
PATENT-3174851	17S PAT-3174851
PATENT-3174930	14S PAT-3174930
PATENT-3175155	08S PAT-3175155
PATENT-3175156	08S PAT-3175156
PATENT-3175158	08S PAT-3175158
PATENT-3175162	08S PAT-3175162
PATENT-3175195	08S PAT-3175195
PATENT-3175459	02S PAT-3175459
PATENT-3175469	26S PAT-3175469
PATENT-3175525	22S PAT-3175525
PATENT-3175931	14S PAT-3175931
PATENT-3176154	08S PAT-3176154
PATENT-3176161	08S PAT-3176161
PATENT-3176195	08S PAT-3176195
PB-166 902	19S PB-166 902
PB-167 001	15S PB-167 001
PB-167 005	25S PB-167 005
PB-167 008	25S PB-167 008
PB-167 009	15S PB-167 009
PB-167 010	15S PB-167 010
PB-167 015	15S PB-167 015
PB-167 016	25S PB-167 016
PB-167 017	15S PB-167 017
PB-167 018	15S PB-167 018
PB-167 019	25S PB-167 019
PB-167 022	15S PB-167 022
PB-167 025	15S PB-167 025
PB-167 026	15S PB-167 026
PB-167 027	15S PB-167 027
PB-167 028	15S PB-167 028
PB-167 029	15S PB-167 029
PB-167 030	15S PB-167 030
PB-167 034	15S PB-167 034
PB-167 036	15S PB-167 036
PB-167 038	15S PB-167 038
PB-167 040	15S PB-167 040
PB-167 041	25S PB-167 041
PB-167 042	15S PB-167 042
PB-167 043	15S PB-167 043
PB-167 046	15S PB-167 046
PB-167 047	15S PB-167 047
PB-167 048	25S PB-167 048
PB-167 050	15S PB-167 050
PB-167 052	15S PB-167 052
PB-167 053	25S PB-167 053
PB-167 054	15S PB-167 054
PB-167 055	09S PB-167 055
PB-167 056	25S PB-167 056
PB-167 057	25S PB-167 057
PB-167 058	15S PB-167 058
PB-167 059	15S PB-167 059
PB-167 060	15S PB-167 060
PB-167 062	15S PB-167 062
PB-167 063	15S PB-167 063
PB-167 070	15S PB-167 070
PB-167 071	15S PB-167 071
PB-167 072	15S PB-167 072
PB-167 073	15S PB-167 073
PB-167 074	15S PB-167 074
PB-167 078	15S PB-167 078
PB-167 079	25S PB-167 079
PB-167 080	15S PB-167 080
PB-167 081	15S PB-167 081
PB-167 082	15S PB-167 082
PB-167 083	15S PB-167 083
PB-167 084	15S PB-167 084
PB-167 085	15S PB-167 085
PB-167 086	15S PB-167 086
PB-167 087	15S PB-167 087
PB-167 088	15S PB-167 088
PB-167 091	15S PB-167 091
PB-167 092	15S PB-167 092
PB-167 094	15S PB-167 094
PB-167 095	25S PB-167 095
PB-167 096	15S PB-167 096
PB-167 098	15S PB-167 098
PB-167 102	15S PB-167 102
PB-167 103	15S PB-167 103
PB-167 104	15S PB-167 104
PB-167 105	15S PB-167 105
PB-167 106	15S PB-167 106
PB-167 107	15S PB-167 107
PB-167 108	26S PB-167 108
PB-167 109	20S PB-167 109
PB-167 110	20S PB-167 110
PB-167 114	20S PB-167 114
PB-167 118	02S PB-167 118
PB-167 119	02S PB-167 119
PB-167 120	02S PB-167 120
PB-167 121	02S PB-167 121
PB-167 122	02S PB-167 122
PB-167 123	02S PB-167 123
PB-167 124	02S PB-167 124
PB-167 125	02S PB-167 125
PB-167 126	02S PB-167 126

ACCESSION/REPORT NO.	DIV ACCESS. NO.
PB-167 127	02S PB-167 127
PB-167 128	02S PB-167 128
PB-167 129	02S PB-167 129
PB-167 130	02S PB-167 130
PB-167 131	02S PB-167 131
PB-167 132	02S PB-167 132
PB-167 133	02S PB-167 133
PB-167 134	02S PB-167 134
PB-167 135	02S PB-167 135
PB-167 136	02S PB-167 136
PB-167 137	02S PB-167 137
PB-167 138	02S PB-167 138
PB-167 139	02S PB-167 139
PB-167 140	02S PB-167 140
PB-167 141	02S PB-167 141
PB-167 142	02S PB-167 142
PB-167 143	02S PB-167 143
PB-167 144	02S PB-167 144
PB-167 145	02S PB-167 145

ACCESSION/REPORT NO.	DIV ACCESS. NO.
PB-167 146	02S PB-167 146
PB-167 147	02S PB-167 147
PB-167 148	02S PB-167 148
PB-167 149	02S PB-167 149
PB-167 150	02S PB-167 150
PB-167 151	02S PB-167 151
PB-167 152	02S PB-167 152
PB-167 153	02S PB-167 153
PB-167 154	02S PB-167 154
PB-167 155	02S PB-167 155
PB-167 156	02S PB-167 156
PB-167 157	02S PB-167 157
PB-167 158	02S PB-167 158
PB-167 159	02S PB-167 159
PB-167 160	02S PB-167 160
PB-167 161	02S PB-167 161
PB-167 162	02S PB-167 162
PB-167 163	02S PB-167 163
PB-167 164	02S PB-167 164

ACCESSION/REPORT NO.	DIV ACCESS. NO.
PB-167 165	02S PB-167 165
PB-167 166	02S PB-167 166
PB-167 183	33S PB-167 183
PB-167 186	33S PB-167 186
PB-167 198	14S PB-167 198
PB-167 199	26S PB-167 199
PB-167 207	02S PB-167 207
PB-167 299	02S PB-167 299
RPL-TDR-64-25	12S AD-447 995
R64-ELS-8	02S PB-167 120
SDL-3-OD6146	02S PB-167 136
SDL-5-OD-6146	02S PB-167 137
SNR-221	02S PB-167 157
SN-183-2	02S PB-167 127
SN-187	02S PB-167 128
02832-14-T	26S PB-167 199
63GL121	02S PB-167 122
63GL122	02S PB-167 123
92-216-1	19S PB-166 902

PRICE LIST

ORDER NO.	DIV	HC-PRICES-MF	
AD-447 995	12S	$10.5	
PB-166 902	19S	$2.00	$0.50
PB-167 001	15S	$1.00	$0.50
PB-167 005	25S	$3.00	$0.75
PB-167 008	25S	$2.00	$0.50
PB-167 009	15S	$1.00	$0.50
PB-167 010	15S	$1.00	$0.50
PB-167 015	15S	$1.00	$0.50
PB-167 016	25S	$1.00	$0.50
PB-167 017	15S	$1.00	$0.50
PB-167 018	15S	$1.00	$0.50
PB-167 019	25S	$1.00	$0.50
PB-167 022	15S	$1.00	$0.50
PB-167 025	15S	$2.00	$0.50
PB-167 026	15S	$2.00	$0.50
PB-167 027	15S	$2.00	$0.50
PB-167 028	15S	$3.00	$0.75
PB-167 029	15S	$1.00	$0.50
PB-167 030	15S	$1.00	$0.50
PB-167 034	15S	$1.00	$0.50
PB-167 036	15S	$1.00	$0.50
PB-167 038	15S	$3.00	$0.75
PB-167 040	15S	$1.00	$0.50
PB-167 041	25S	$1.00	$0.50
PB-167 042	15S	$1.00	$0.50
PB-167 043	15S	$2.00	$0.50
PB-167 046	15S	$1.00	$0.50
PB-167 047	15S	$1.00	$0.50
PB-167 048	25S	$2.00	$0.50
PB-167 050	15S	$1.00	$0.50
PB-167 052	15S	$3.00	$0.75
PB-167 053	25S	$1.00	$0.50
PB-167 054	15S	$1.00	$0.50
PB-167 055	9S	$1.00	$0.50
PB-167 056	25S	$2.00	$0.50
PB-167 057	25S	$1.00	$0.50
PB-167 058	15S	$2.00	$0.50
PB-167 059	15S	$2.00	$0.50
PB-167 060	15S	$2.00	$0.50
PB-167 062	15S	$2.00	$0.50
PB-167 063	15S	$3.00	$0.75
PB-167 070	15S	$2.00	$0.50
PB-167 071	15S	$1.00	$0.50
PB-167 072	15S	$1.00	$0.50
PB-167 073	15S	$2.00	$0.50
PB-167 074	15S	$1.00	$0.50
PB-167 078	15S	$2.00	$0.50
PB-167 079	25S	$2.00	$0.50
PB-167 080	15S	$2.00	$0.50
PB-167 081	15S	$2.00	$0.50
PB-167 082	15S	$1.00	$0.50
PB-167 083	15S	$1.00	$0.50
PB-167 084	15S	$2.00	$0.50
PB-167 085	15S	$2.00	$0.50
PB-167 086	15S	$1.00	$0.50
PB-167 087	15S	$2.00	$0.50
PB-167 088	15S	$2.00	$0.50
PB-167 091	15S	$2.00	$0.50
PB-167 092	15S	$1.00	$0.50
PB-167 094	15S	$2.00	$0.50
PB-167 095	25S	$3.00	$0.75
PB-167 096	15S	$1.00	$0.50
PB-167 098	15S	$3.00	$0.75
PB-167 102	15S	$1.00	$0.50
PB-167 103	15S	$1.00	$0.50
PB-167 104	15S	$2.00	$0.50
PB-167 105	15S	$3.00	$0.75
PB-167 106	15S	$2.00	$0.50
PB-167 107	15S	$1.00	$0.50
PB-167 108	26S	$3.00	$0.75
PB-167 109	20S	$1.00	$0.50
PB-167 110	20S	$2.00	$0.50
PB-167 114	20S	$2.00	$0.50
PB-167 118	2S	$2.00	$0.50
PB-167 119	2S	$2.00	$0.50
PB-167 120	2S	$3.00	$0.75
PB-167 121	2S	$2.00	$0.50
PB-167 122	2S	$3.00	$0.50
PB-167 123	2S	$2.00	$0.50
PB-167 124	2S	$2.00	$0.50
PB-167 125	2S	$4.00	$1.00
PB-167 126	2S	$2.00	$0.50
PB-167 127	2S	$3.00	$0.75
PB-167 128	2S	$2.00	$0.50
PB-167 129	2S	$4.00	$0.75
PB-167 130	2S	$1.00	$0.50
PB-167 131	2S	$1.00	$0.50
PB-167 132	2S	$4.00	$1.00
PB-167 133	2S	$2.00	$0.50
PB-167 134	2S	$1.00	$0.50
PB-167 135	2S	$2.00	$0.50
PB-167 136	2S	$2.00	$0.50
PB-167 137	2S	$1.00	$0.50
PB-167 139	2S	$3.00	$0.50
PB-167 140	2S	$2.00	$0.50
PB-167 141	2S	$1.00	$0.50
PB-167 142	2S	$1.00	$0.50
PB-167 143	2S	$2.00	$0.50
PB-167 144	2S	$1.00	$0.50
PB-167 145	2S	$1.00	$0.50
PB-167 147	2S	$1.00	$0.50
PB-167 148	2S	$5.00	$1.25
PB-167 150	2S	$1.00	$0.50
PB-167 151	2S	$1.00	$0.50
PB-167 152	2S	$4.00	$1.00
PB-167 154	2S	$1.00	$0.50
PB-167 155	2S	$2.00	$0.50
PB-167 156	2S	$1.00	$0.50
PB-167 157	2S	$4.00	$1.00
PB-167 158	2S	$4.00	$1.00
PB-167 159	2S	$2.00	$0.50
PB-167 160	2S	$1.00	$0.50
PB-167 161	2S	$4.00	$1.00
PB-167 162	2S	$1.00	$0.50
PB-167 163	2S	$1.00	$0.50
PB-167 164	2S	$2.00	$0.50
PB-167 165	2S	$6.00	$1.50
PB-167 166	2S	$6.00	$1.25
PB-167 183	33S	$3.00	$0.75
PB-167 186	33S	$1.00	$0.75
PB-167 198	14S	$2.00	$0.50
PB-167 199	26S	$1.00	$0.50
PB-167 207	2S	$1.00	$0.50
PB-167 299	2S	$1.00	$0.50

FORM NBS-811 (2-68) U.S. DEPARTMENT OF COMMERCE NATIONAL BUREAU OF STANDARDS

CLEARINGHOUSE ORDER FORM

TO: Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia, 22151

SHIP TO *(If different than sold to)*

SOLD TO *(Name or firm)*

STREET ADDRESS

CITY AND STATE *(Include zip code)* OR CITY AND COUNTRY

DEPOSIT ACCOUNT NO. *(If any)*

YOUR ORDER NO.

DATE

ACCESSION/REPORT NUMBER OR TITLE	TYPE HC/ MF*	QUANTITY	UNIT PRICE	TOTAL PRICE	FOR CFSTI USE: ACTION CODE	VERIFIED BY	EXTRACTED BY	EXTRACTED DATE

IF ADDITIONAL SPACE IS NEEDED, PLEASE ATTACH ANOTHER ORDER FORM

PLEASE INDICATE METHOD OF CASH PAYMENT ☐ CHECK ☐ MONEY ORDER →

MAKE CHECK OR MONEY ORDER PAYABLE TO NATIONAL BUREAU OF STANDARDS - CFSTI

AMOUNT ENCLOSED

$

* Type of copy - **HC** stands for Hard Copy
MF stands for Microfiche

USCOMM-DC 26204-P65

U. S. DEPARTMENT OF COMMERCE FIELD OFFICES
PROVIDE READY ACCESS TO COMMERCE SERVICES

• The Department of Commerce maintains Field Offices in the cities listed below for the purpose of providing ready access to the reports, publications, and services of the Business and Defense Services Administration, Bureau of International Commerce, Clearinghouse for Federal Scientific and Technical Information, Office of Business Economics, and the Bureau of the Census. Information on activities of the National Bureau of Standards, Patent Office, and the Area Redevelopment Administration is also available.

• Experienced personnel will gladly assist in the solution of specific problems, explain the scope and meaning of regulations administered by the Department, and provide practical assistance in the broad field of domestic and foreign commerce. Field offices act as official sales agents of the Superintendent of Documents and stock a wide range of official Government publications relating to business. Each office maintains an extensive business reference library containing periodicals, directories, publications, and reports from official as well as private sources.

Department Field Offices

Albuquerque, N. Mex., 87101, U.S. Courthouse. 247-0311.
Anchorage, Alaska, 99501, Room 306, Loussac-Sogn Building. Phone: BR 2-9611.
Atlanta, Ga., 30303, 75 Forsyth St., N.W. 526-6000.
Baltimore, Md., 21202, 305 U.S. Customhouse, Gay and Lombard Streets. Phone: PLaza 2-8460.
Birmingham, Ala., 35203, Title Bldg., 2030 Third Ave., North. Phone: 325-3131.
Boston, Mass., 02110, Room 230, 80 Federal Street. CApitol 3-2312.
Buffalo, N.Y., 14203, 504 Federal Building, 117 Ellicott Street. Phone: 842-3208.
Charleston, S.C., 29401, No. 4, North Atlantic Wharf. Phone: 722-6551.
Charleston, W. Va., 25301, 3002 New Federal Office Building, 500 Quarrier Street. Phone: 343-6196.
Cheyenne, Wyo., 82001, 207 Majestic Bldg., 16th & Capitol Ave. Phone: 634-5920.
Chicago, Ill., 60604, 1486 New Federal Building, 219 South Dearborn Street. Phone: 828-4400.
Cincinnati, Ohio, 45202, 8028 Federal Office Building, 550 Main Street. Phone: 381-2200.
Cleveland, Ohio, 44101, 4th Floor, Federal Reserve Bank Bldg., East 6th St. & Superior Ave. 241-7900.
Dallas, Tex., 75202, Room 1200, 1114 Commerce Street. RIverside 9-3287.
Denver, Colo., 80202, 142 New Custom House, 19th & Stout Street. Phone: 297-3246.
Des Moines, Iowa, 50309, 1216 Paramount Building, 509 Grand Avenue. Phone: 284-4222.
Detroit, Mich., 48226, 445 Federal Bldg. 226-6088.
Greensboro, N.C., 27402, Room 412, U. S. Post Office Building. 275-9111.
Hartford, Conn., 06103, 18 Asylum St. Phone: 244-3530.
Honolulu, Hawaii, 96813, 202 International Savings Bldg., 1022 Bethel Street. Phone: 588667.
Houston, Tex., 77002, 5102 Federal Bldg., 515 Rusk Ave. CA 8-0611.
Jacksonville, Fla., 32202, 512 Greenleaf Building, 208 Laura Street. ELgin 4-7111.
Kansas City, Mo., 64106, Room 2011, 911 Walnut Street. BAltimore 1-7000.
Los Angeles, Calif., 90015, Room 450, Western Pacific Building, 1031 S. Broadway. 688-2833.
Memphis, Tenn., 38103, 345 Federal Office Building, 167 N. Main Street. Phone: 534-3214.
Miami, Fla., 33130, 1628 Federal Office Bldg., 51 S.W. First Avenue. Phone: 350-5267.
Milwaukee, Wis., 53203, Straus Bldg., 238 W. Wisconsin Avenue. Phone: BR 2-8600.
Minneapolis, Minn., 55401, Room 304, Federal Bldg., 110 South Fourth Street. Phone: 334-2133.
New Orleans, La., 70130, 909 Federal Office Building (Scuth), 610 South Street. Phone: 527-6546.
New York, N. Y., 10001, 61st Fl., Empire State Bldg., 350 Fifth Avenue. LOngacre 3-3377.
Philadelphia, Pa., 19107, Jefferson Building, 1015 Chestnut Street. 597-2850.
Phoenix, Ariz., 85025, New Federal Bldg., 230 N. First Avenue. Phone: 261-3285.
Pittsburgh, Pa., 15219, Room 2201, Federal Building, 1000 Liberty Avenue. Phone: 644-2850.
Portland, Oreg., 97204, 217 Old U. S. Courthouse, 520 S. W. Morrison Street. 226-3361.
Reno, Nev., 89502, Room 2028, 300 Booth Street. Phone: 784-5203.
Richmond, Va., 23240, 2105 Federal Building, 400 North 8th Street. Phone: 649-3611.
St. Louis, Mo., 63103, 2511 Federal Building, 1520 Market Street. MAin 2-4243.
Salt Lake City, Utah, 84111, 3235 Federal Building, 125 South State Street. 524-5116.
San Francisco, Calif., 94102, Federal Building, Box 36013. 450 Golden Gate Avenue. Phone: 556-5864.
Santurce, Puerto Rico, 00907, Room 628, 605 Condado Avenue. Phone: 723-4640.
Savannah, Ga., 31402, 235 U. S. Courthouse and Post Office Bldg., 125-29 Bull Street. 232-4321.
Seattle, Wash., 98104, 809 Federal Office Bldg., 909 First Avenue. MUtual 2-3300.

FEDERAL REGIONAL TECHNICAL REPORT CENTERS

Each of the Federal Regional Technical Report Centers listed below contains a collection of USAEC, NASA, and DOD unclassified reports as well as reports of other U. S. Government agencies and provides reference, interlibrary loan, and reproduction services.

Carnegie Library of Pittsburgh
4400 Forbes St.
Pittsburgh, Pa. 15213

Columbia University
Engineering Library
Seeley W. Mudd Building
New York, N. Y. 10027

Georgia Institute of Technology
Price Gilbert Library
Atlanta, Ga. 30300

The John Crerar Library
35 West 33rd St.
Chicago, Ill. 60616

Library of Congress
Science and Technology Division
Washington, D. C. 20540

Linda Hall Library
5109 Cherry Street
Kansas City, Mo. 64100

Massachusetts Institute of Technology
M. I. T. Libraries
Cambridge, Mass. 02139

Southern Methodist University
Science Library
P. O. Box 1339
Dallas, Tex. 75222

University of California
General Library
Berkeley, Calif. 94704

University of Colorado
Boulder, Colo. 80301

University of Washington Library
Government Documents Center
Seattle, Wash. 98105

UNIVERSITY MICROFILMS INC
313 N FIRST STREET
ANN ARBOR MICHIGAN
GRR JUNE

UNITED S
GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS
WASHINGTON, D.C. 20402

OFFICIAL BUSINESS

POSTAGE AND FEES PAID
U.S. GOVERNMENT PRINTING OFFICE

The Clearinghouse Announces . . .

the regularly monthly publication of the **Government-Wide Index to Federal Research and Development Reports,** providing scientists, engineers, librarians and management with a single reference guide to new unclassified Government-sponsored R and D in the physical sciences, engineering and related technology.

The *Government-Wide Index* is compiled each month by computer manipulation of indexing records from the previous month of the following four agency announcement journals:

Nuclear Science Abstracts, Atomic Energy Commission

Scientific and Technical Aerospace Reports, National Aeronautics and Space Administration

Technical Abstract Bulletin, Defense Documentation Center

U. S. Government Research and Development Reports, Clearinghouse for Federal Scientific and Technical Information

The *Government-Wide Index to Federal Research and Development Reports* is printed and sold by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402. Price is $10 for a one-year subscription (12 issues); add $2.50 for foreign mailing; single issue, $1.25. Make remittance payable to Superintendent of Documents.